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EXCAVATING ENGINEER

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About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

Vol. 28 NOVEMBER, 1934 No. 11

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Building San Gabriel Dam No. 1.
The construction of this huge rock fill dam presents many interesting features. West Slope Construction Company is the contractor on this $8,000,000 project.

The Walker Invades the Coal Fields.
Carey Baxter & Kennedy use walking Diesel dragline successfully on 3,000,000 yard stripping contract in Pennsylvania.

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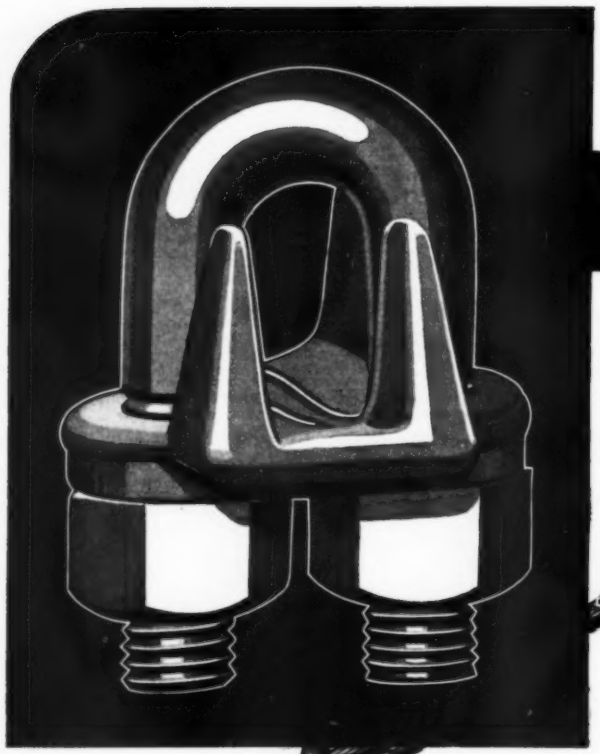

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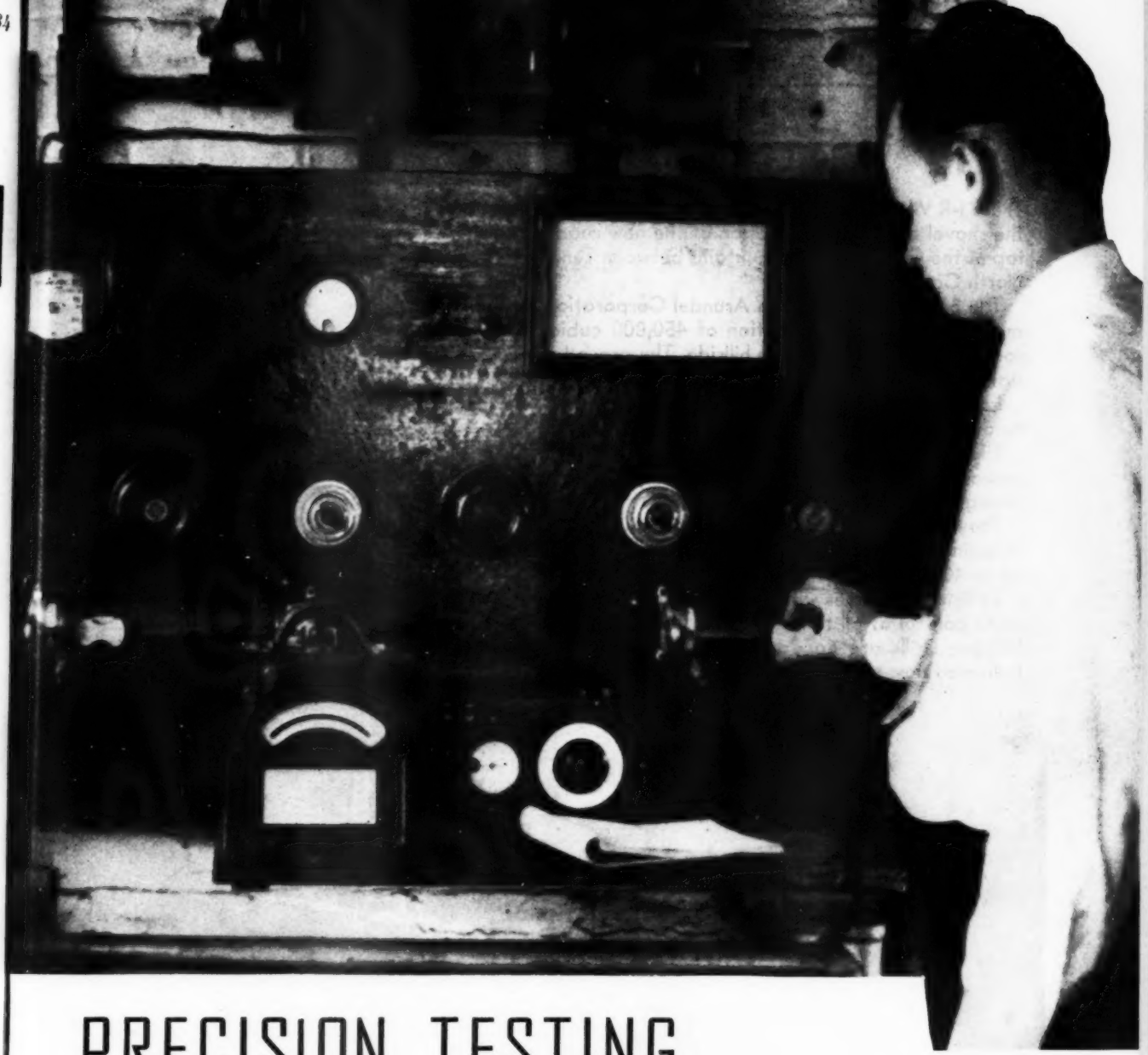

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I-R WAGON DRILLS

These I-R Wagon-Mounted Drills are keeping well ahead of the shovel on a 7.6-mile section of the new road along the top of the Great Smoky Mountains between Tennessee and North Carolina.

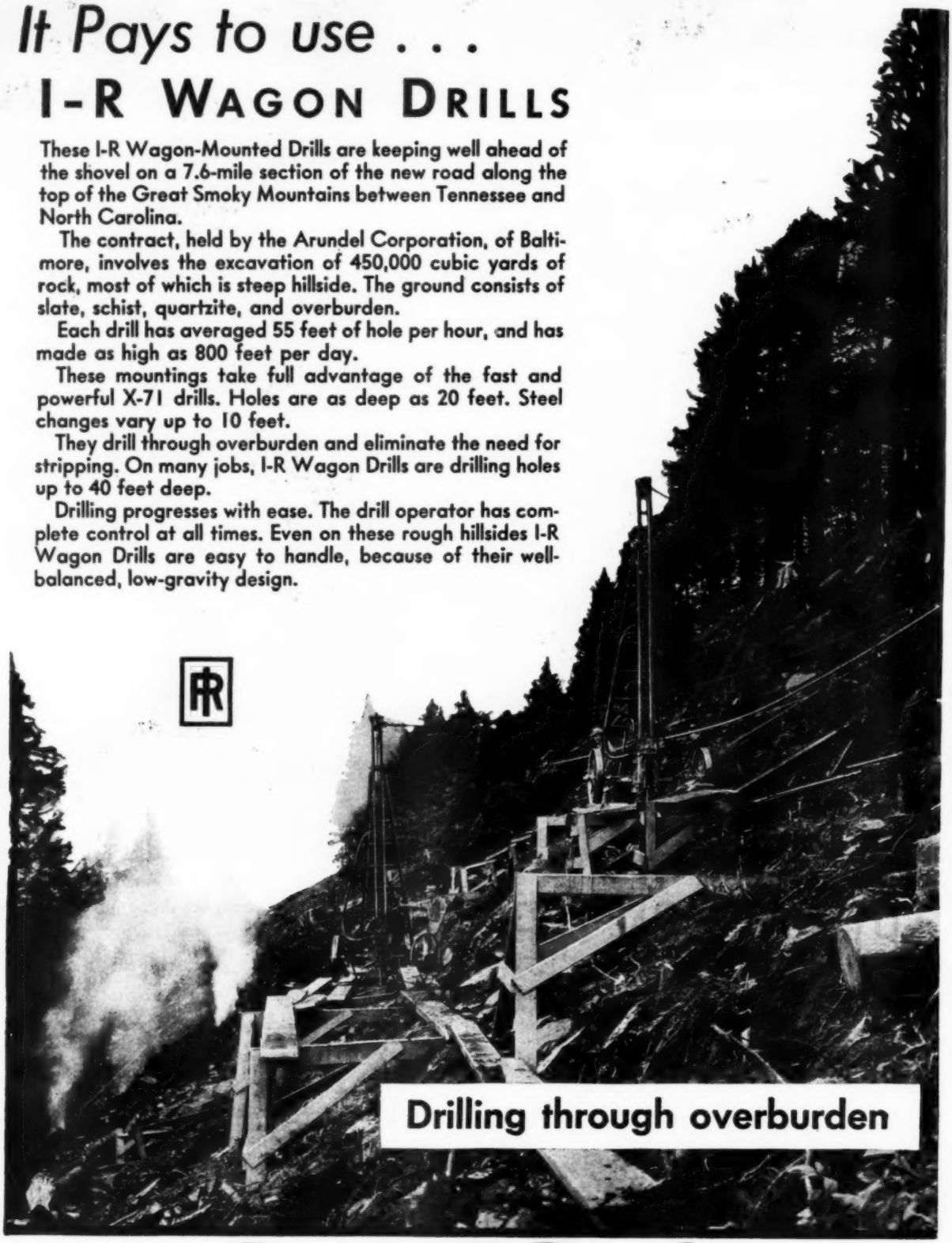
The contract, held by the Arundel Corporation, of Baltimore, involves the excavation of 450,000 cubic yards of rock, most of which is steep hillside. The ground consists of slate, schist, quartzite, and overburden.

Each drill has averaged 55 feet of hole per hour, and has made as high as 800 feet per day.

These mountings take full advantage of the fast and powerful X-71 drills. Holes are as deep as 20 feet. Steel changes vary up to 10 feet.

They drill through overburden and eliminate the need for stripping. On many jobs, I-R Wagon Drills are drilling holes up to 40 feet deep.

Drilling progresses with ease. The drill operator has complete control at all times. Even on these rough hillsides I-R Wagon Drills are easy to handle, because of their well-balanced, low-gravity design.



Drilling through overburden

11 BROADWAY **Ingersoll-Rand** NEW YORK, N. Y.

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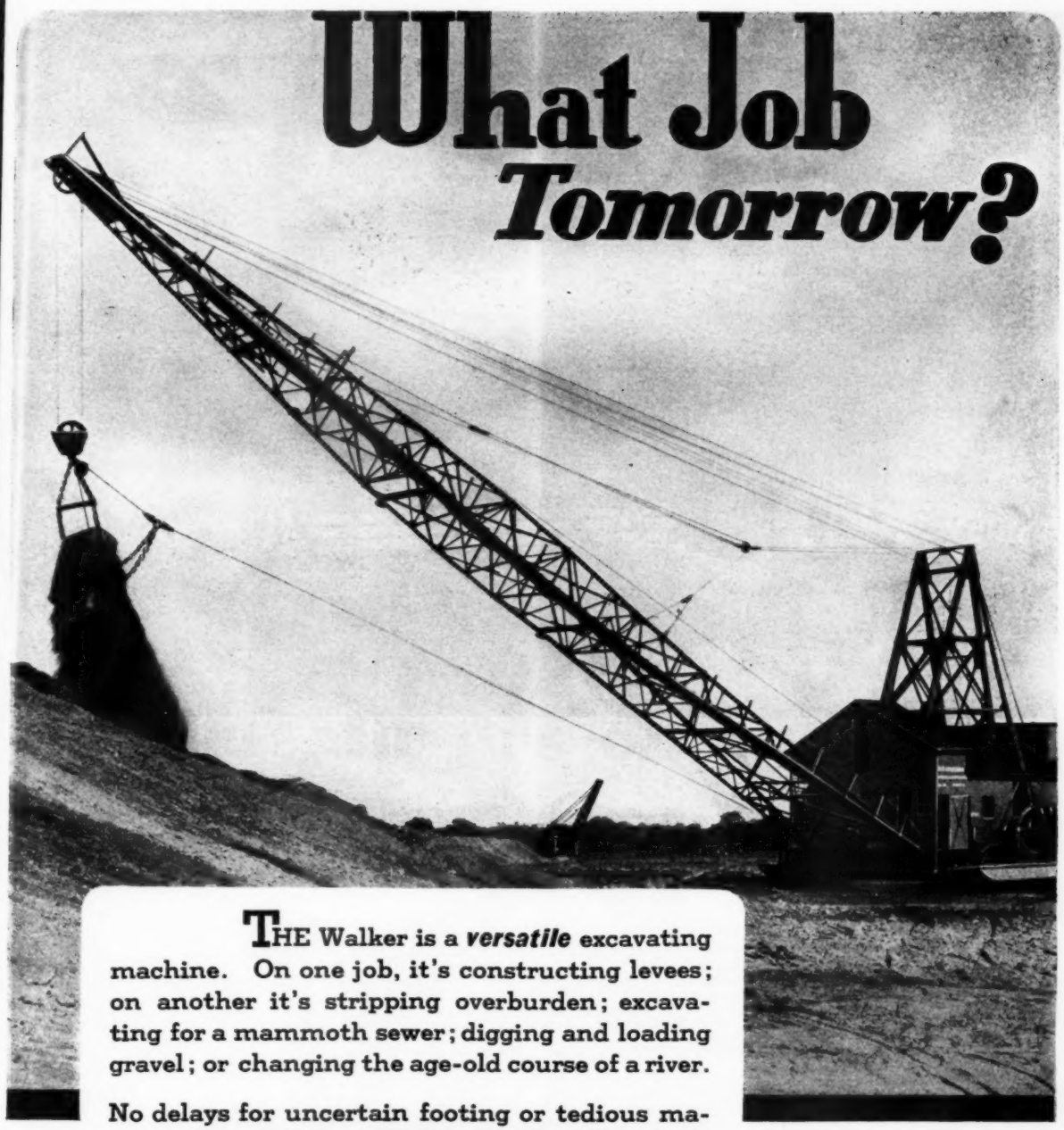

THE Walker is a ***versatile*** excavating machine. On one job, it's constructing levees; on another it's stripping overburden; excavating for a mammoth sewer; digging and loading gravel; or changing the age-old course of a river.

No delays for uncertain footing or tedious maneuvering—it's the ***walking dragline!*** But don't let that minimize the fact that the Bucyrus-Monighan has won its reputation because of its GREAT DIGGING performance, turning in amazing yardage records at surprisingly low cost. Bucyrus-Monighan Company, Chicago, Ill.

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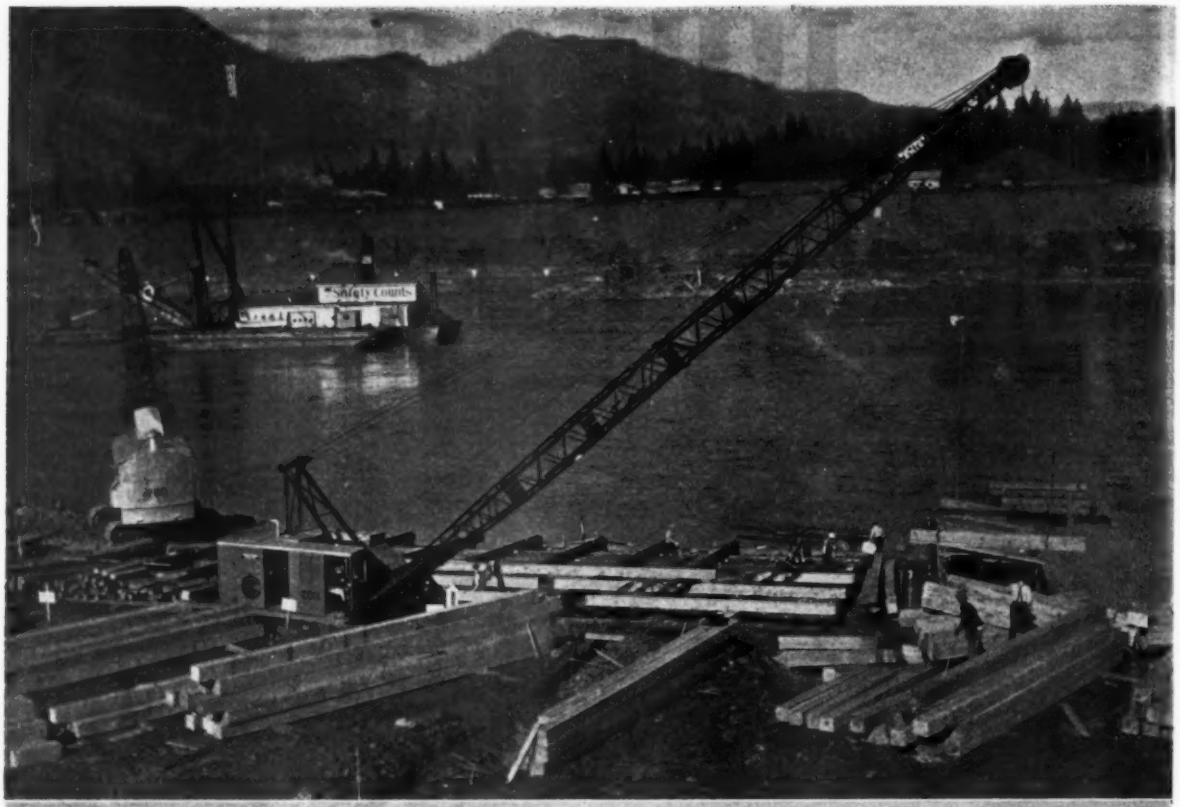

Progress on Bonneville Dam!

Here are a couple of pictures just received from Bonneville where Columbia Construction Company is making rapid progress on their nine million dollar contract for the spillway dam. This navigation and power project is located 40 miles up the Columbia River from Portland.

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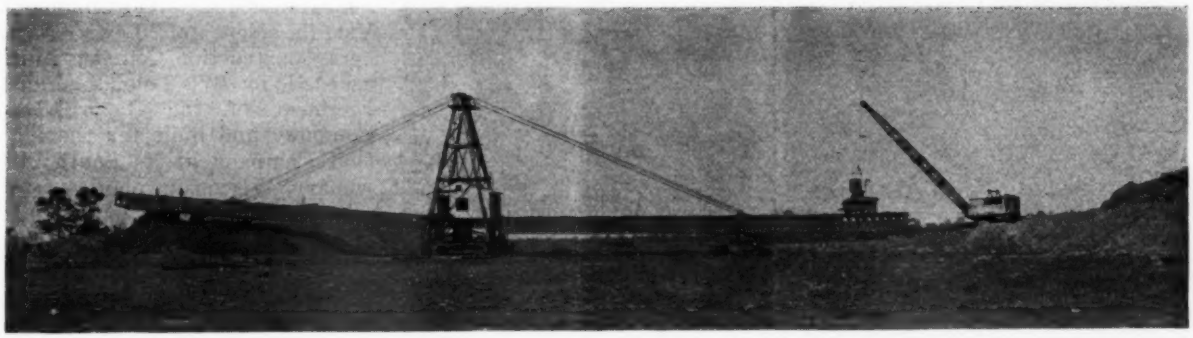


The Chambers Bridge has a working range of approximately 350 feet. A ten-yard car hauls the dirt to the levee making a round trip, on the average, every 50 seconds.

Something New in Dirt Movers on the River

Lewis-Chambers Construction Company, Inc., tackle their dirt moving problem successfully with the Chambers Bridge.*

By C. D. CALKINS

EARLY PIONEERS from Virginia, finding the land lying between the Mississippi and White rivers in what is now Arkansas "as fertile as the Valley of the Nile," decided to locate here. They brought in their families and slaves, and formed a settlement which has, through song and story, found a permanent niche in the history of the Mississippi valley as "Laconia Circle." This settlement is located approximately 120 miles down the river from Memphis, Tennessee.

Before many years had passed, the new settlers became weary of the annual spring floods which devastated their fertile acres. In 1877 they founded one of the first levee districts on the River. The original levee, built in the form of a circle enclosing approximately 27,000 acres of fertile plantations, reached a maximum height of four feet. It was constructed by crude methods involving a tremendous amount of hand labor. Notches, cut in trees at high water, were used in lieu of grade stakes.

In later years, when the Federal government came to the aid of the plantation owners in the great Mississippi valley, the Laconia Circle Levee District was incorporated into the comprehensive Federal levee program and that levee was raised to correspond in height with the entire system.

7,000,000 yards in Laconia Circle Levee

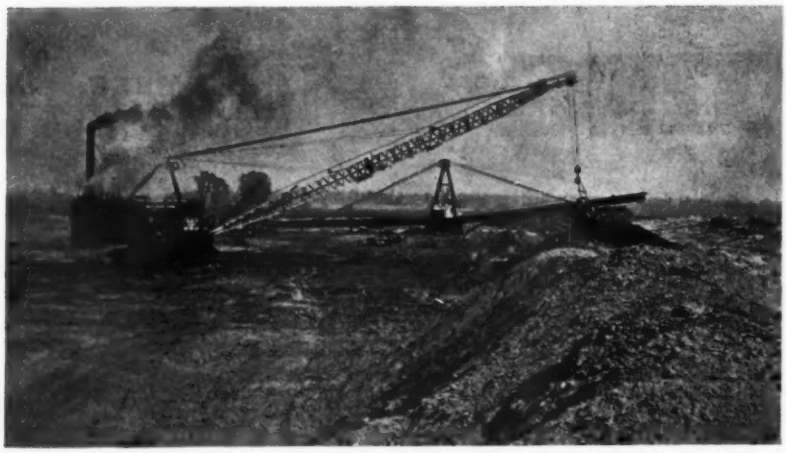
Late in 1933 lettings involving 7,000,000 yards in this levee were held. The Lewis-Chambers Construction Company, Inc., of New Orleans, well known river contractors, were awarded contracts totaling 3,966,000 yards of earth at an average price of 24.98 cents per yard.

*Editor's Note—The Chambers Bridge is a recent development in dirt moving equipment deserving a somewhat detailed description.

As stated in the story, this machine was originated by John T. Chambers, Vice-president of Lewis-Chambers Construction Company, Inc., and built by the Bucyrus-Erie Company at their South Milwaukee, Wisconsin, plant, according to the design of Mr. Chambers and Mr. Lehman, Chief Engineer of Bucyrus-Erie Company.

The Bucyrus-Erie engineers tell us that "the Chambers Bridge consists of a mobile frame, mounted on caterpillar trucks, supporting two bridges of substantially equal length extending from the sides of the frame. These bridges are suspended by a wire rope tackle from an A-frame structure and may be raised and lowered to provide an angle suitable to the operating conditions. In a sense this machine is a mobile hoist similar to a mine hoist having a car traveling on rails in a horizontal or inclined plane and taking the excavated material from a hopper at the loading end and transporting it to the point of discharge. The frame carries the machinery and power unit to move the car to dumping positions, return it to the loading position and to perform the other functions of hoisting and lowering the bridges and propelling.

"The Chambers Bridge performs a dual function on excavating projects; first, it increases the operating range of the excavating unit and second, it increases the output of the excavator since it permits it to spend a greater portion of its operating time in actual digging, due to the fact that the transportation part of the cycle is taken over by conveyor means."



Here the Class 230 dragline with its 175-foot aluminum boom is roughing in ahead of the Bridge.

The work consists of building a new levee at certain locations; and at others, enlarging the old levee. Specifications call for a standard B-section levee with river-side slopes approximately 1 to 3½ and with 1 to 6½ seepage line. The height varies from 17 to 32 feet. The job is approximately ten miles long. Generally the material going into the levee is light sandy loam, but in some places a stiff clay is encountered. The usual clearing and grubbing is necessary on some parts of the work.

As the Lewis-Chambers Construction Company was, at that time, engaged in a large government contract on the Shipland Levee near Mayersville, Mississippi, one-half million yards were sublet to Ramey & Moore Construction Company; one-half million yards to H. N. Rogers & Son; and 400,000 yards to the Tennessee Valley Construction Company, all of Memphis.

Lewis-Chambers moved in on the job during January and February, 1934. The equipment was brought to Laconia on barges from the Shipland Levee and landed as near the work as possible. Considerable time was spent in tracking the various machines an unusually long distance from the river to the point where operations were to start. In addition, a camp for the workers was established, and the necessary shops set up. The machines were given a complete overhauling to put them in the best condition for a long run.

To build the 2,500,000-yard levee, the company has placed on the job:

2 Bucyrus-Erie Class 230 steam oil-burning draglines, truck-mounted, each with 175-foot aluminum boom and 6-yard bucket; one of which started work in February and the other in March.

1 Bucyrus-Erie Diesel 45-B dragline, with 65-foot boom and 2-yard bucket.

1 Bucyrus-Erie Diesel 52-B dragline, with 60-foot boom and 3-yard bucket.

1 Northwest dragline with 1-yard bucket and 40-foot boom; and

4 Allis-Chalmers crawler mounted tractors, each equipped with bulldozer attachments.

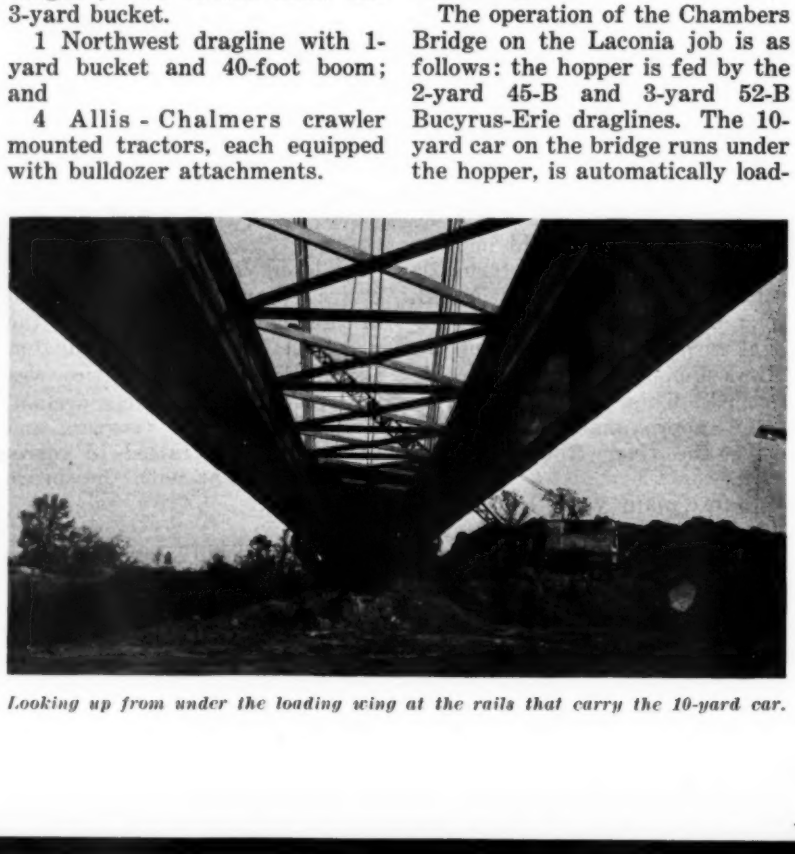
An unusual piece of equipment for levee building

But the principal and most unusual piece of earth moving equipment placed on the job was their Chambers Bridge, the only machine of its kind yet constructed. This machine was originated and designed by J. T. Chambers, Vice-President of Lewis-Chambers Construction Company, Inc., assisted by W. Lehman, Chief Engineer of the Bucyrus-Erie Company and built for them by that Company at its South Milwaukee, Wisconsin, plant.

The Chambers Bridge consists of a plate-girder structure 372½ feet long, supported by a double A-frame tower in the center. From the top of this A-frame, hoisting cables extend to both ends of the bridge. The supporting A-frame tower contains the power plant and operating controls and is mounted on caterpillar treads to facilitate moving.

On tracks mounted on the girders of the bridge, a ten-yard car carries the dirt from one end of the bridge to the other, and is propelled by a cable attached to drums driven by the main engine. A hopper at the loading end is filled by either one large or two small draglines.

The operation of the Chambers Bridge on the Laconia job is as follows: the hopper is fed by the 2-yard 45-B and 3-yard 52-B Bucyrus-Erie draglines. The 10-yard car on the bridge runs under the hopper, is automatically load-



Looking up from under the loading wing at the rails that carry the 10-yard car.

Bringing the dirt a long ways. The two draglines working in tandem with the Bridge can reach dirt almost 600 feet from where it is dumped into the levee. This combination, while it gives extra reach, cannot come anywhere near utilizing the capacity of the conveying unit. Ordinarily both draglines dump directly into the hopper.

ed, and then runs to the other end of the bridge where its load is dumped into the levee. The car is at all times under the direct control of the operator who is so placed, in the tower of the A-frame, with his controls, as to command a clear view of all operations. The car is dumped by means of an electric solenoid operated by a control switch at the operator's position and so arranged that it cannot be dumped on the loading side of the machine. Another safety device is an indicator, in front of the operator, which shows, at all times, the exact location of the car. This has been found of great value when fogs obscure the ends of the machine.

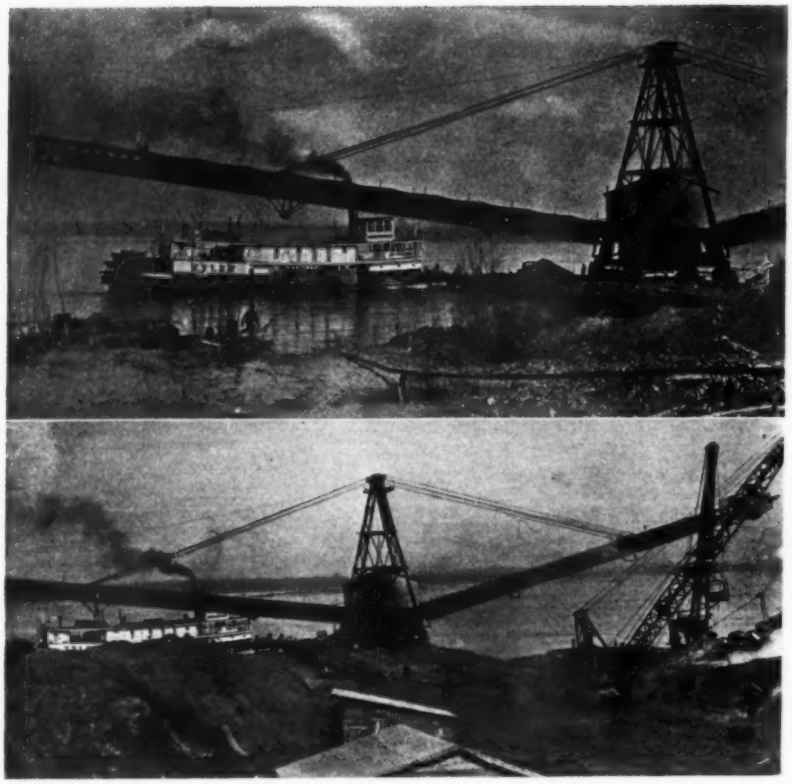
On enlargement work the Bridge with its attending draglines builds the entire section as it progresses. New levee must be built in two runs. The Bridge builds the landside slope first with material taken from the inside portion of the borrow pit. The second run completes the levee as the Bridge brings in material from the far end of the pit, with the loading end of the Bridge spanning the excavated portion of the pit.

The output and operation of the Bridge and dragline combination compares favorably with other types of equipment of its size and capacity. The machine on this work has been capable of transporting all the material either the two small draglines or the 6-yard dragline were able to feed it without delay to them. The machine will haul approximately nine cubic yards gross on cycles averaging 50 seconds. Cycles have been made in 42 seconds. The peak production, so far measured on this job, has been 7,840 yards of material placed in the levee in 24 hours.

Looking along the top of the loading wing toward the hopper. The car may be seen in the middle foreground as it speeds along below the top bracing.

Because of its unusual length and the fact that the entire weight of the two wings is carried by the A-frame structure mounted on caterpillars, one under each corner, the Bridge was carefully designed to obtain maximum structural strength with minimum weight. As a result the entire unit weighs only 278 tons which may be compared with the 329-ton working weight of a Class 230 truck mounted, steam dragline.

The Bridge works on mats which have been developed especially for this job. These mats are 9 inches thick by 8 inches wide and 14 to 16 feet long, made up of 3 x 8″ oak planks nailed together. One of the Allis-Chalmers tractors with a bulldozer is used for a few hours to move these mats into tracking position and is then available the rest of



Bringing the Bridge ashore at Laconia. No wonder the pilot was astonished when he saw this "bird" through the morning mist!

the day for dressing levee, preparing or tracking right-of-way and any other job that may come up. The general mobility of the Bridge is such that it has negotiated successfully extremely soft wet ground, and slopes of approximately seven percent, in addition to getting on and off barges in moving from one job to another.

Moving the Bridge from one working position to the next on levee work generally requires from three to four minutes.

While radically different from more conventional types of dirt-moving equipment, the utility of the Bridge has been demonstrated by its practically continous service since it was first installed on the river in the fall of 1932 to build the Kempe-Lake St. John levee near Waterproof, La. The 1932-3 winter season was marked by excessive rainfall, extending almost continually over several months and was followed by excessive seepage water from the spring rise in the river. The soil was heavy, sticky clay and was heavily saturated until mid-summer. The Bridge kept in operation throughout this period, with the exception of two months when seepage water stopped all work. During these winter months the Bridge was called upon to handle very difficult material in the shape of wet, sticky clay, and to track over very soft ground. It met this test very well and handled material satisfactorily. It completed its work on this contract in September, was moved down steep slopes and loaded on a pair of 7′ x 28′ x 120′ steel barges strapped together and was transported approximately 150 miles to the Shipland Levee near Mayersville, Mississippi, where it worked for the remaining months of the year to complete that contract and was transported again by barges to the Laconia work during January and February this year.

The success of this machine in competing with draglines on a cost basis for long distance hauling is apparent from the records of the Lewis-Chambers organization, which show that its operation has been considerably lower in comparison with the cost of moving dirt the same distance with large draglines.

Diesel power used

Power for all operations of the Bridge is obtained from a six-cylinder 150 H.P. Worthington Diesel engine, requiring approximately 100 to 120 gallons of fuel per 24 hours. Various clutches at the operator's position, control the operation of the car, movement of the entire machine, and the raising and lowering of each end of the Bridge. A 7½-KW Westinghouse generator supplies electric current for the lights and for the operation of the solenoid car dump.

The crew necessary to operate the Bridge consists of one foreman, and for each shift, one operator, one oiler, one trackman and one hopperman. One spotter or flagman is used on the dump to direct the placing of the dirt. Three shifts are used, each working 8 hours.

Astonishes old time river pilot

When the Bridge was loaded on barges at the finish of Kempe-Lake St. John Levee job to be transported up the Mississippi River to the Shipland Levee, the tow was made up at night. The

(Continued on Page 508)

Lewis-Chambers Construction Company's camp . . . a clean and comfortable home for the crew.

500-foot tunnel section built for use in new Fox movie

By **A. B. LAING**

Movies go Underground

A TUNNELING "set" — reproduced for the first time in cinema history— will be seen upon the release of a forthcoming photoplay. Originally titled "Man Lock", it has been changed to "East River" on the advice of engineering and advertising experts retained by the studio, at Hollywood, where the picture is now in production.

The section of tunnel which has been constructed is the most noteworthy of the many sets that were necessary. It is full size, and approximately 500 feet in length. Patterned on the famous Fulton Street bore under the East River, between Brooklyn and Manhattan, it is built with considerable fidelity to technical detail. An actual shield has been built at the working end along with the usual working platforms, gantries, hydraulic jacks and other equipment.

Actual excavating operations—such as the driving of the shield and the removal of the mud and rock from within the locks will be shown.

Among the many "props" bought for use in the movie, are a tunnel locomotive, twelve dump cars, and a number of special tools such as air drills and hammers. Two hoists and four regular cages operate in the shaft which was sunk to a depth of twenty feet. Compressors and pumps were rented by the film company.

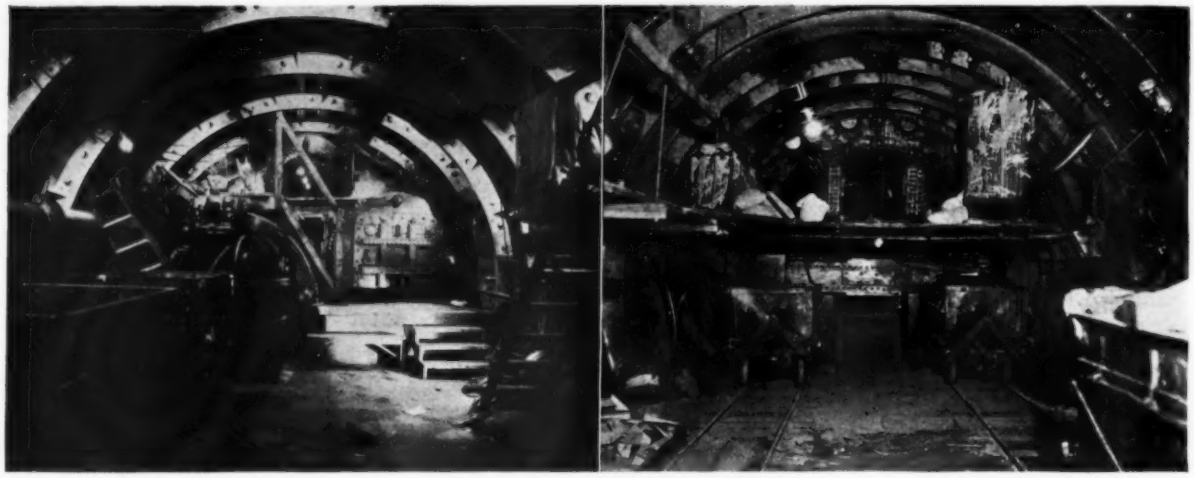
Costs Run High

Contractors will be interested in making a comparison between their own costs of tunnel driving and the cost of screen representations of the same. The **overhead** (or "nut" as the showfolks term it) ran just over $2,000 per hour on this picture—during a production period of approximately seventy days. This does not take into account the preparation period for the underground sets and props, which consumed about six weeks—before actual "shooting" began, and gave work to about 1700 regular employees on the Fox Film Corporation's payroll.

It will probably come as a surprise to engineers to learn that for cinematographic purposes, the hoists and cages which took the shifts up and down to and from the air locks were located at a point on the 'lot' about one-half mile from the locks. However this should in nowise detract from the entertainment value, or destroy the illusion for experienced excavating men who chance to see the film.

Those "lay" engineers who descend into a tunnel set for the first time are usually amazed by the extraordinary combination or juxtaposition of the bona fide and the "phoney". You see, for instance, a quivering air hose. It runs parallel to a line carrying water for jetting and other purposes. But alongside is another six-inch pipe line not required to "emote"; it is constructed of

● *In the illustration above, Edmund Lowe and Victor McLaglen are apparently arguing forcibly as to who is boss on this job. Behind them the "extras" enact their roles to complete the tunnel scene.*



● *These two views give some idea of the completeness with which these sets were constructed. At the left are the air-locks, shown under working conditions. The cars have been brought into the pressure chamber enroute to the working face shown at the right. This part of the set was complete to the last detail of the driving shield.*

turned solid redwood; bolts, couplings and other fittings skillfully turned and carved at the mill—all coated with metallic paint. You glimpse an actor opening a 10-inch gate valve of solid bronze, but try to open an identical adjacent valve and you discover that it doesn't work — having been fabricated of laminated sugar pine. (Incidentally it might be mentioned that one of the so-called "fan" magazines offers a standing cash prize of $1 for every technical discrepancy of this kind its readers can turn up in current films.)

Noted Stars in Film

This "East River" saga of the sand hogs, for which all these elaborate preparations have been made, will feature Charles Bickford, the noted screen "hard guy". Edmund Lowe and Victor McLaglen play heading bosses of rival tunnel crews—and are, naturally, constantly at sword's points. Supplying the romantic, or heart-interest of this underground story are two lovely stars, Marjorie Rambeau and Grace Bradley.

Dramatic action reaches a high during a "blow" when the river is seen breaking into the workings—and is supported by many other exciting and amusing events in the lives of excavators.

To divulge the details or the denouement of this exciting story would be to rob the producers of their chief asset—*audience-surprise values.* Readers of this publication, however, will doubtless feel like giving the moviemakers a "hand" for bringing this unique offering to the screen.

"East River" was written by Borden Chase, an author who has had ten years of practical excavating experience. He has been in the employ of Mason & Hanger of New York City and worked on the Fulton St. tunnel job.

By a coincidence of theatrical casting, Charles Bickford who holds the spotlight in this picture spent a number of years below ground. After graduating from the Massachuetts Institute of Technology, he worked on the subway tube under the Charles River between Cambridge and Boston. As a result, he is perfectly at home on tunnel "sets".

As an added means of ensuring authenticity in presentation of this screen attraction, the company sent Director Raoul Walsh

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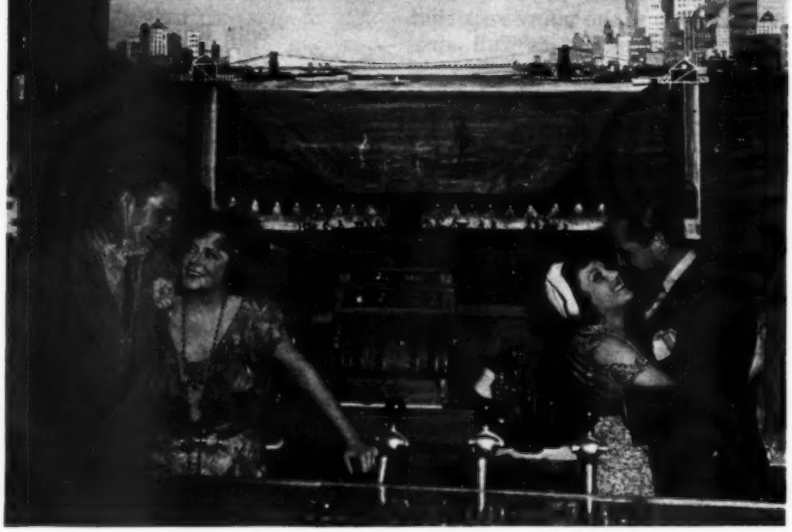


● *After many reels of battles and arduous struggles, the tunnel is completed and our two heroes celebrate at their favorite cabaret where a panorama of the job ornaments the back bar. From left to right: Victor McLaglen, Marjorie Rambeau, Grace Bradley, Edmund Lowe.*

Contractor's Right to Excavated Material

ARTHUR L. H. STREET
Attorney at Law

LAYMEN often razz lawyers for making contracts too long. To a considerable extent the criticism is justified. But a desire for brevity should not be carried too far. After all, ink and paper are not very expensive. Economy in their use is often dearly paid for in litigation.

No important phase of an excavating contract should be left to assumption or supposition, when it can be clearly covered by an express agreement. When valuable materials are to be excavated, the contract should leave no doubt as to who is to be entitled to them. An object lesson appears in a case decided by the New York Court of Appeals (115 N. E. 993).

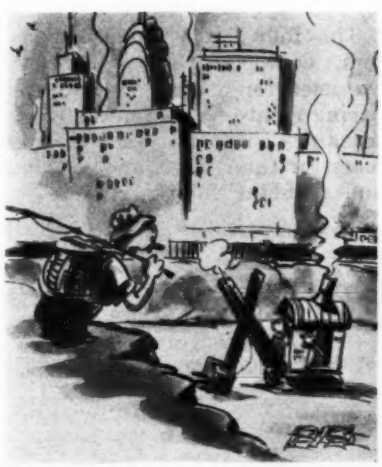
A subcontractor for excavating for a public improvement was to be paid so much per yard for earth removed. The general contract called for removal of flagstone sidewalks, under classification as earth excavation, and provided that this material should become the general contractor's property. Nothing was said in the subcontract about ownership of the stones. Disposing of a controversy between the general contractor and the subcontractor, the Court of Appeals said:

"Six thousand square feet of flagstones were on the ground when the plaintiff [the subcontractor] was discharged. He has charged the defendant [the general contractor] with their value. We do not think they belonged to him. There is no claim that he was told that he could have them. There is no evidence of any usage. The argument is that by implication of law he succeeded as a subcontractor to the rights of the contractor. We think the argument is untenable."

It is to be noted that this decision assumes that the excavated material belonged at least to the principal contractor. The rights of the owner of the land were not considered.

The disposal of excavated material seems to be a problem that runs back into the centuries. The "Treasury of Wit" published in London in 1786 contains a yarn about a property owner whose employees asked what they should do with dirt resulting from excavating for a cellar. He directed them to dig a hole and bury the dirt in it! When they asked what they should do with dirt removed from the hole, he replied with some spirit, "Make the hole big enough to hold all the dirt!"

A less troublesome problem was submitted to the Pennsylvania Superior Court in a case involving an excavating contractor's right to stone removed from a site for a school building. (71 Pa. Super. 269.) In that case, the contract provided that the excavating contractor "shall also cart away all stone that are not fit to be used in the future operations by the general contractor. . . . Should a solid ledge, boulder or loose stone be encountered in making excavations, the excavating contractor is to excavate the same by blasting or other process, and is to remove unfit stone from or deposit it on the site if fit to be used."



COURTESY 1000 NEW JOKES -- DELL PUB. CO.

"I said worms! What would you charge to dig a few worms?"

Interpreting these provisions, the court said:

"The question is, did the above words reserve to the school board such stone as were fit and necessary for use in the school building, or was the word 'fit' intended to describe the quality of the stone irrespective of the fact whether such stones were actually required in the erection of the building, or to express it differently, were stones suitable for any building to be the property of the school board, or was it the intention that only such stones as were to be used in the school building were to belong to the board? The [trial] court took the view that the object of the school district was to reserve such stone as it could actually use in the building about to be erected. This we think was correct. 'The future operations' of the general contractor referred to were not all future operations, but such as would be engaged in under the contract. The erection of a school building was the subject of the agreement of the parties. The school board could not know to what extent stone would be found in the material excavated but it took the precaution of providing that such stones as were found which could be used by it, should be its property."

Accordingly, the excavating contractor was adjudged to be entitled to a judgment for $1,345.80, the value of stone disposed of by the general contractor, over and above that required for use in constructing the school building.

Similarly the highest courts of Massachusetts and New York held in recent years that, in the absence of express direction what is to be done with the excavated material, or express reservation of title to this material by the

(Continued on Page 509)

Something New in Dirt Movers

(Continued from Page 504)

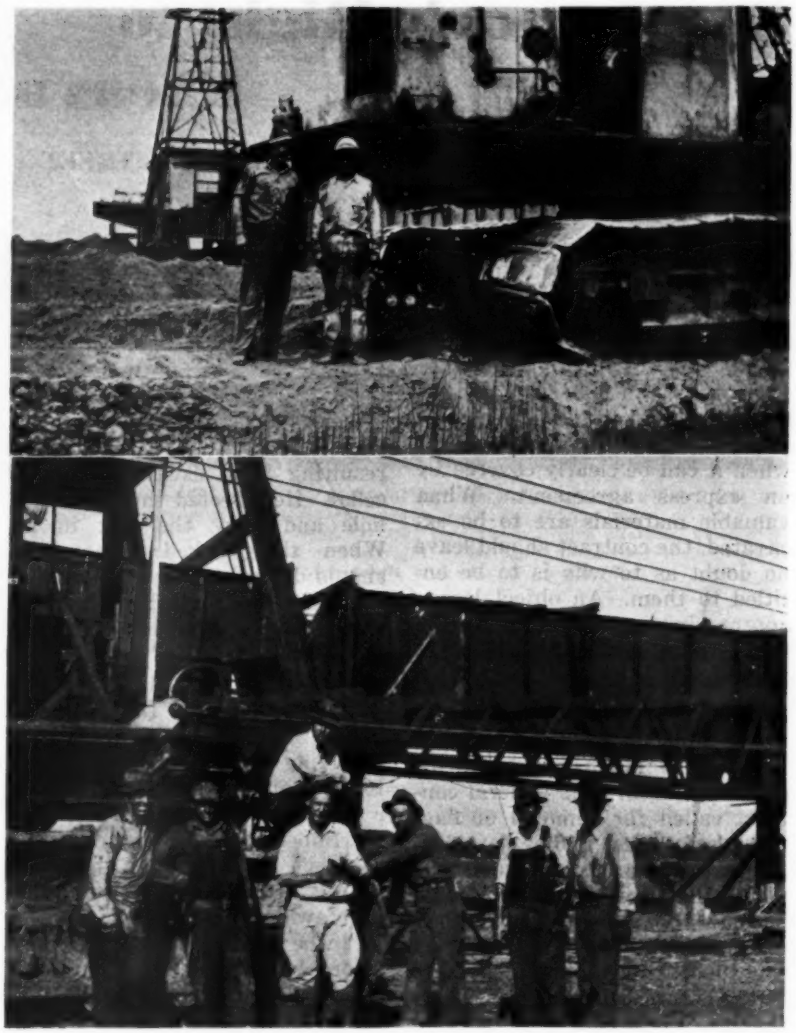
pilot came aboard early the following morning and, as the mists cleared away, looked ahead to see of what his tow consisted. With one glance at the wide-spread wings of the giant Bridge he turned, startled, to the captain and gasped, "What in hell is that?" "Oh," replied the captain, "That's the blue eagle you've been hearing about."

The other features of the Laconia job are duplicates of other levee jobs on the river. The two 6-yard Class 230's work mostly on new levee and construct it by old established methods. Being truck-mounted, each machine requires extensive track sections and attendant labor crews.

The Lewis-Chambers Class 230 machines are equipped with 175-foot aluminum booms installed in 1931. The aluminum construction permits use of a 25-foot longer boom than when steel construction is used with no reduction in bucket size. The additional working range is a very definite advantage on this type of work and economies effected soon offset the additional investment.

The 1-yard Northwest dragline is used to dig search ditches, load trucks and do general utility work. Comparatively few roads, ditches or trenches were required other than the usual muck ditch called for in the specifications.

After a levee section is completed, it is dressed to grade by bulldozers followed by fresnoes. Sodding is done by placing the sod in furrows cut by a hill-side plow and covering it by hand shovels.



Top: D. W. Gilbert, dragline foreman and J. Threlfall, Diesel engineer, see that the draglines are always in good running order. Bottom: Here is another group of levee builders. C. A. Colon, foreman in charge of the Bridge, is standing with hands on the dragline treads.

The four Allis-Chalmers tractors, equipped with bulldozers, are used for dressing levee, preparing right-of-way for the track machines, moving and placing mats for the Bridge, and clearing and grubbing for the levee.

J. H. Lewis, senior member of Lewis - Chambers Construction Company, Inc., is in active charge of all field operations at Laconia Circle.

A. H. Milan is foreman of the Class 230 steam draglines; C. A. Colon, foreman of the Bridge and D. W. Gilbert is foreman of the Diesel draglines. C. H. Morrison is chief field clerk and J. H. Frederickson, Jr., is the company's civil engineer.

For the government, F. E. Cleary is in general charge of all of the contracts in Laconia Circle. C. A. Beardsley is Chief Inspector in charge of four items on Snow Lake and Laconia Levees and A.

After the levee is built up to the required grade by the Bridge, it is finished with bulldozers and fresnoes and then sodded.

R. Hyatt is Chief Inspector in charge of two items on Knowlton Levee.

The Lewis-Chambers camp, located about 3 miles from the village of Snow Lake, consists of portable houses for the white men, a frame office building, large kitchen and dining room, and tents for the colored help. Laid out in straight streets, the entire camp is kept "spic and span," a model little town of its own.

Movies go Underground

(Continued from Page 506)

east to spend a week in the Hudson tunnel.

Spiders Provide Excitement

One of the many amusing production incidents was provided by Siegfried Rumann, a German actor. An amateur entomologist of note, he discovered a couple of black widow spiders in the air lock. Wishing to take them home for observation, after the day's shooting was done, he stowed them temporarily in a dinner pail. Looking about for a likely place to hide the dangerous insects, he decided that the medical lock was the coolest and most secluded spot.

Later in the day, however, Director Walsh instructed Rumann (playing the role of the tunnel contractor's doctor) to send McLaglen into the lock to undergo treatment for his supposed case of the "bends."

The scene started out well, but in the middle of it the theoretically afflicted McLaglen burst open the door of the lock and emerged in considerable excitement not called for in the script.

"Listen, I don't mind having the bends," he roared, "but there's nothing in my contract that says a battalion of spiders have to use me for a parade ground!"

Apart from its lighter side, the film "East River" packs a certain significance for the engineering profession.

As a piece of favorable propaganda, it is destined to acquaint the millions of moviegoers throughout the world with some of the marvels of American tunneling methods. It will constitute an unconscious, though worthwhile "tie-in" to the regular promotional efforts of American equipment manufacturers and dealers; and throw the spotlight on the problems and working conditions of a normally "submerged" group.

And, if the picture is a box-office success, it will assuredly be followed (after the immemorial Hollywood manner) by a flock of imitators — a veritable cycle of tunneling and excavating pictures.

All of which focuses public attention and interest on tunneling and excavating projects—through what Will Hays describes as "the subtle power of suggestion emanating from the screen."

Ancient Ways in Modern Days

THESE blacksmiths of Karnak-Lagone, Cameroon, West Africa, need little in the way of equipment. A hole in the ground makes a suitable forge . . . a couple of goat skin bags with wooden handles, the bellows . . . an iron peg is a good enough anvil . . . a pair of tongs, a couple of hammers and a bowl for the charcoal complete the establishment. When King David's workmen prepared the iron for the building of King Solomon's Temple his smiths probably used equipment much like this.

Contractor's Right

(Continued from Page 507)

owner of the land, the implication is that such material belongs to the excavating contractor (214 Mass. 402; and 204 N. Y. 73). An early lower court New York case (30 N.Y.S. 924) had held to the contrary, namely that a contract to excavate valuable materials does not constitute these materials the property of the contractor, and this seems to be the law in Ontario (36 Ont. L. 415); although the contrary, at least in New York, could have been established by proof of local custom (19 Wend. 386).

An interesting related question is as to whether the contractor is bound to excavate valuable material at all, under a general excavating contract. Thus a lower court New York case (8 N.Y.S. 150) has held that a contract to excavate does not include removing any rock which may be encountered; whereas the highest court in Virginia has held that "excavating" means the removal of everything, but that a local custom to pay extra for rock-removal will modify the popular meaning of the word "excavate", if both parties knew of the custom (98 S.E. 763, 765).

EQUIPMENT
You Ought to Know About

New Wind-up Attachment

A NEW POWER Door Wind-Up Attachment for bottom-dump crawler wagons has recently been put on the market by Trackson Company, of Milwaukee, Wis., which has met with immediate acceptance from contractors. These Wagon Winds are simple and dependable and effect remarkable operating economies. They are actually simpler and contain fewer parts than most hand winds, and can be mounted inexpensively on various types of bottom-dump wagons.

The mechanism which attaches to the front of the wagon is self-contained and does not interfere with the rear end hand-winding device. It consists of a shaft carrying two, narrow, door-winding drums, a ratchet with a tripping arrangement, and a power-line drum, which is changeable to either end of the shaft.

Across the back of the tractor is attached a beam containing a

long coil spring which connects with a bell crank, and this is also changeable to either end of the beam. A cable connects this crank with the end drum at the wagon. The trip rope extends from a trip lever to the tractor driver's seat.

The tractor driver simply pulls the trip rope to discharge the load. As the doors open the cable unwinds from the large drums and winds on the end drum. After the doors are dumped they remain open until the tractor driver pulls the trip rope, which enables him to leave the doors open as long as desired and to close them when he chooses.

In order to wind the doors one angle turn of the tractor is required, which unwinds the power drum and winds up the door-cable carrying drum. The doors close fully at one turn of the tractor.

A Heavy Duty Trailer on Pneumatics

THROUGH THE efforts of the C. R. Jahn Co., Builders Building, Chicago, distributors of the LaCrosse heavy duty trailers, a new tire has been developed which substantially lowers the cost of pneumatic-tired trailers.

The new pneumatic-tired models of LaCrosse Tu-Way Trailers will be equipped with these new tires unless otherwise specified. The tires are heavy duty, 10 ply and have a capacity of 3600 lb. The diameter is less than 30 in. The loading platform is less than 30 in. above the ground permitting easy loading over the ends as well as over the sides and makes possible the purchase of pneumatic-tired equipment at a cost only slightly greater than solid-tired equipment. Such a tire requires a wheel only 15 in. in diameter. This permits a particularly stocky, sturdy wheel of unusual strength. Wheels are mounted on Timken bearings and have demountable rims.

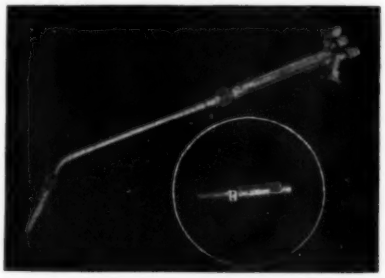
New Stationary Oxweld Generator

THE LINDE Air Products Company, 30 East 42nd St., New York, N. Y., has just announced another important addition to its acetylene generating equipment. This new automatic stationary generator, known as the Oxweld Type MP-5, is rated to deliver 1,000 cu. ft. of acetylene per hour. It is listed by the Underwriters' Laboratories, Inc. Its advent should be of great interest to users who want high capacity without operating two or more generators simultaneously.

Complete information regarding the equipment mentioned on this page may be had by writing the manufacturers. We will appreciate your mentioning EXCAVATING ENGINEER.

New Blowpipe Head

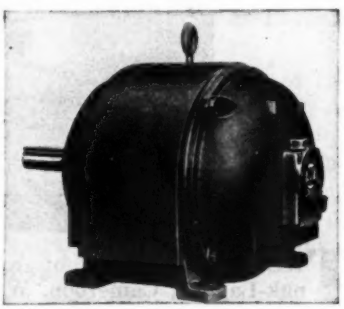
THE LINDE Air Products Company, 30 East 42nd Street, New York, N. Y., has just announced a new welding head,



known as the Multi-Flame Lindewelding Head, for use on W-17 or W-22 Oxweld blowpipes. This head consists of a special chromium-plated stem and tip, available in three sizes; their use depending upon the pipe size. The tip is designed to give three flames; a main welding flame and two smaller auxiliary flames, the latter so positioned as to preheat both edges of the V ahead of the point of welding. Savings of more than 25 per cent in rod and gases and 33-1/3 per cent or better in welding time are claimed with the new head employing the special technique recommended for its use.

Splash-Proof and Weather-Proof Motors

THE WESTINGHOUSE Company announces a new splash-proof, drip-proof and weather-proof motor for use indoors or



outdoors, or for any applications where drippings or splashing liquids are encountered. According to the manufacturer this mo-

(Continued on Page 515)

Old Times & Old Timers

Lightning and Dynamite

OLD TIMER S. A. Elliott of Kittannig, Pa., says that reading the letters published in Excavating Engineer describing experiences of other Old Timers inspired him to write us this letter:

"Your stories of Old Times and Old Timers gives me the fever, so here goes for a yarn. This photo is of a 70-C Bucyrus which I was running for the Mellon & Stewart Company of Pittsburgh. The shovel was later sold to the Pittsburgh Plate Glass Company at Ford City, Pa., and that is where this exciting incident happened. We were opening up a sand quarry for them and were backing up the shovel. They had a shot loaded in well-drill holes 35 feet deep. Twenty-seven of the loaded holes were connected with electric wires. At noon when we were about in the middle of the loaded holes an electric storm came up, lighting struck the wires and set off the shot. No one was hurt as we had all gone to dinner. You can see the dinkey track where the shot moved the shovel about 30 feet. The shovel was shoved completely off the trucks. It took six weeks to dig them out by hand and get the shovel swinging again. The cab was badly used up and the smoke stack tells its own story.

"When the machine went into service again it worked double shift. The first shift was made up of S. A. Elliott, runner, Harry Green, craner and Alvy Geer, fireman. The second shift was Chas. Brown, Lex Larden, and Clarence Yankin.

"I have been running shovels for the past 28 years.

"Come on Old Timers send them in, I love to read them".

We agree with you Old Timer, we want more Old Timers to write and tell us about their experiences in excavating work.

A Dirt Mover from Birth

A YOUNG Old Timer, Fred F. Nichols, who has been in the game, more or less, since birth, writes us from Los Angeles, California about his career.

"I was born in a cabin boat hooked to the rear spud of a government dredge on the Illinois River at Beardstown, Ill., December 10, 1886. The first thing I saw was a dipperful of mud, and have been looking at one ever since. My father, George H. Nichols, was the engineer. Of course, I don't recall the incident, but Father took to the dry land rigs and the first shovel I remember seeing was at Cincinnati. It had a single engine, and no wheels at all, but wooden rollers on timbers as used in moving houses.

"One day I heard Dad tell Mother that the big stunt would be the next day which was Sunday. Dad was like a boy, so enthused over it—A Barnhart shovel with wheels. But the wheels were cuts of a large log with the shaft run through and a pin on the outside. I don't remember if the wheels had bands shrunk around them or not, but I think they did. Anyhow, she rattled aplenty while being pulled along by 45 teams or 45 head. I am pretty sure it was the former, tho' I was only about five years old then.

"I used to take Dad's dinner to him, and then I began to take more notice. After dinner I would sit on a powder keg on the circle near Scotty, the craneman, and ride. My next experience was at Braddock, Pennsylvania, when I was about 9 years of age. Dad was running a little Giant or Vulcan shovel for the T. A. Gillespie Company, and in moving the shovel to load and ship to Messina, New York, the sprocket chain let go and the shovel started down Jones Avenue, of her own accord, at the rate of about 60 or 70 miles per hour, and stopped very suddenly when she hit a two-story house about a quarter of a mile down. Yes, I was on the front, with a death grip around the right mast brace. No one was hurt, except me. My left big toe was smashed by the head of a track jack that fell over and caught my bare toe between it and the steel floor. Mike Coffee was the Super, Elmer Williamson the blacksmith helper.

"My first job was the following school vacation at Youngwood, Pennsylvania. I was water boy at 10 cents an hour, and carried 2 buckets of water 2½ miles to a thirsty bunch of Polocks who lived on salt mackeral, or something dry. Boy, how they could drink water! The shovel was a Style A, single hoist engine and would stop on dead center and the fireman, "Bug House" Kelley, would have to take a 2 x 4 and pry her over center in order to get going. Others on that job were "Flat Wheel" Skelly, "Bug House" Murphy, a craneman on the Double A.A.; "Old Man" Collins, master mechanic; and George Gardner, Frank Palmer, dinkey skinners. H. S. Kerbaugh had a Model 60 on an adjoining job. I forget the shovel runner's name, but he lives at Belfont, Pennsylvania. J. K. Jolly was the contractor on our job.

(Continued on Page 530)

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The Business Situation

AN UNUSUALLY good memory is not necessary to recall the manner in which business declined from the middle of 1929 to the middle of 1932. During those three years industrial production dropped from about 14 per cent above a computed normal to approximately 47 per cent below that normal, and it reached that low point by a series of rapid recessions interrupted by temporary improvements in business. Since 1932 we have made a series of gains interrupted by recessions of varying length and intensity. Each recession has had quite definite causes but has been of shorter duration than the one before it. Although the estimate of industrial activity for September, 1934, is lower than for any month since April, 1933, it is quite evident that we have two years of recovery behind us.

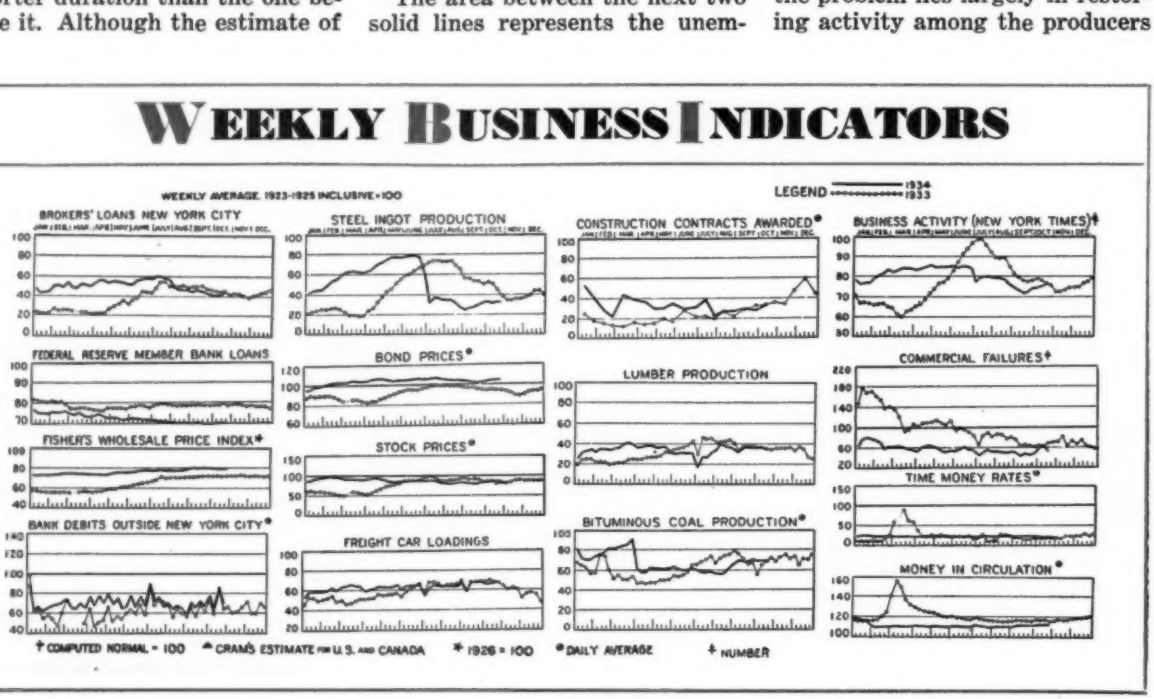
Perhaps the most serious problem of the depression is the problem of unemployment, and, as we have pointed out before in these pages, to an analysis of that we may well turn for guidance in our efforts to find the "key log in the jam." We reproduce on the following page a diagram prepared by the Cleveland Trust Company showing the amount of unemployment in three major groups.

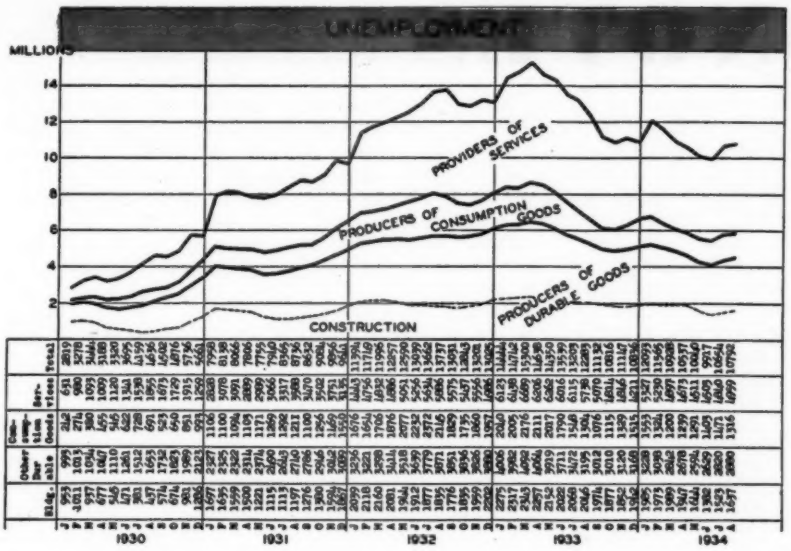
In the diagram the area between the base line just above the figures and the irregular dashed line, represents the unemployed each month since the beginning of 1930 in the construction industries, while the lowest column of figures gives their numbers in thousands of workers. Buildings are durable goods and so are many industrial products made of such lasting materials as the metals, lumber, cement, clay, glass, and stone. The unemployed in these other durable goods industries are represented by the area between the dashed line and the lowest solid line, and their estimated numbers in thousands are stated in the second column.

The area between the next two solid lines represents the unemployed in the industries making or raising consumption goods such as foods, and textiles, and articles made of paper, rubber, leather, and the like. The figures are in the third column. The uppermost area, and the figures in the fourth column, represent unemployed in the service occupations such as wholesale and retail trade, transportation, communication, professions, public positions, and domestic work.

Study of this diagram quickly shows that between four and five million persons at present unemployed come from the producers of durable goods and a similar number come from a group which may best be designated as providers of services. Only between one and two million unemployed come from the producers of consumption goods. Since it is obvious that an increase in the production of durable and consumption goods would call for an increase in the service industries, it follows that increasing employment in the goods-producing industries would automatically increase employment in the service industries. Since the great majority of unemployment in the goods-producing industries lies among the producers of durable goods, it is clear that the key to the problem lies largely in restoring activity among the producers

WEEKLY BUSINESS INDICATORS





of durable goods and this can best be done by still further improving business confidence and increasing the ease with which long term financing may be obtained.

Large federal expenditures for public works have given us definite increases in construction volume. But we must look to increasing private expenditure for sustained volume in both the construction industry and that larger group, the durable goods industries.

The volume of new construction projects started in the 37 Eastern States during September reached a total of $110,219,200 according to the contract records of F. W. Dodge Corporation. This total represents a loss of more than 8 per cent when compared with the August volume of $120,014,600 and approximately the same percentage decline from the September, 1933 total of $120,134,400.

An examination of the construction classes indicates no pronounced decline in any specific type of building. Residential building contracts awarded during the month totaled $17,871,600 as compared with $18,641,000 for August and $21,549,000 for September of last year. Non-residential building during the month amounted to $42,359,300 as contrasted with $50,816,900 for the preceding month and $37,836,300 for the corresponding month of last year. Public works, with increased highway work, showed an actual increase over August, the totals amounting to $43,478,500 and $41,905,900 respectively.

The cumulative totals for the first nine months of this year in each of the 10 major classes of construction show material gains when compared with the corresponding period of last year. In fact the cumulative total for all types of construction, amounting to $1,203,952,100 is almost equal to the total for the entire year 1933 and exceeds the nine months total of last year by more than 62 per cent. Non-residential building with a total amounting to $432,259,200 shows a gain of more than 46 per cent over the corresponding 1933 total of $294,921,000. The public works total for the year to date is more than twice the total for the corresponding nine months of last year with contracts amounting to $491,444,400 and $210,420,600 respectively. Gains of this year over last year amounted to more than 66 per cent in the public utilities classification and to more than 4 per cent for residential building.

Winter Comes!

BACK in the stone age that meant huddling close by the fire . . . chinking the cracks against the cold winds . . . huddling beneath the furs to keep warm . . . tightening your belt against hunger when the food ran low.

This winter will mean much the same thing to many in this modern civilization of ours unless jobs are provided for those who are willing and want to work.

If you have a job to do try to keep it going this winter. Perhaps it will take a little extra planning . . . perhaps you can't move your dirt or pour your concrete quite as fast or as cheaply . . . dynamite for blasting, canvases for covering, and salamanders for heating may add unplanned items to your costs . . . but keep the job moving, keep your crews working, do all you can to make the public works program to relieve unemployment effective.

With modern equipment winter work is practical and, in many cases, results in actual savings when overhead and equipment rentals are taken into consideration. Don't accept the old fashioned notion that construction and excavation cannot be carried out in winter without checking into the actual facts. Look over the work you have to do, pick out the items where cold will handicap you least. Estimate your comparative costs . . . if there's a chance of working through without serious financial loss give work this coming winter a ride!

Strippers, Attention!

WHAT old timer can give us the earliest case of stripping being done in the following manner: a dragline on the ground level first removes the upper layer of overburden by a series of parallel cuts, sloping the side of the bank to prevent slides. A shovel on the coal or rock or ore level follows the dragline with a series of parallel cuts, removing the lower layer of overburden and placing its spoil on top of the spoil of the dragline. If you haven't a complete record give us the nearest you have.

FIELD NOTES

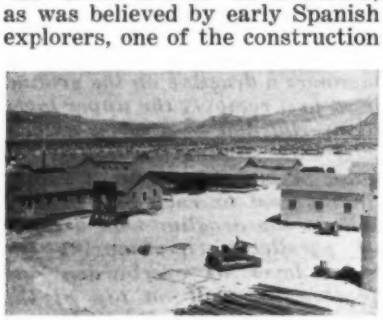
Quickly Made Warning Signs

IN STILL damp weather, the usual red warning flag is useless as far as being seen from a distance is concerned. For complete safety, a solid red disc of

considerable size is necessary. The above photo shows the emergency use of a number of old fruit basket covers for this purpose. Quickly painted bright red and nailed to a stout stake, they make a satisfactory warning signal as they can be seen from a considerable distance. — *Frank W. Bentley, Jr.*

Aluminum Paint Reduces Interior Temperatures of Desert Buildings

THOUGH THERE may be no "Cities of Gold" in California, as was believed by early Spanish explorers, one of the construction



camps alongs the Colorado River Aqueduct has the appearance of being made of silver.

Ben Arp, superintendent of the Utah Construction Company's Iron Mountain Tunnel Camp, had all of the camp buildings given a coat of aluminum paint in order to obtain the lowest possible interior temperatures. The camp is located seventy miles west of the Colorado River, in the heart of the California desert region, where outside temperatures of 130 degrees are not unusual. With the aluminum paint deflecting the heat rays the daytime interior temperature of these buildings is approximately 20 percent lower than that on the outside, which helps considerably. White paint when used for the same purposes makes no noticeable difference in interior temperatures.

—*John R. Marcy.*

Making Use of Water Flow Measuring Method

IN THE MAY issue of *Excavating Engineer*, there was published a formula, which I had developed, for determining the rate of flow of water through a pipe, hose, or fitting. The formula was

$$5.65d^2\ H = G$$

when d = internal diameter of pipe in inches; H = maximum height of jet in inches, and G = gallons per minute.

A reader raised the question as to how this formula worked out in actual practice and its accuracy.

Out of the many applications where the formula has been used, space permits me to mention but two.

Some years ago, at a small western college, the graduating class presented a drinking fountain to the school. Since in those days the fountains discharged continually, the question of the amount of water to be consumed was an important one due to the limited capacity of the pump. The fountain was designed to project the stream of water upward 2½ inches through a ¼-inch orifice. Applying these figures in the formula, the theoretical discharge was .558 gallons per minute, or 268 gallons in 8 hours. Actual tests proved the flow to be but slightly more, the error lying in the difficulty in measuring accurately the height of the jet.

Some time ago I had occasion to apply the above formula to a cooling water problem for a Diesel engine. The owner of the engine wanted to know how he could determine the gallons per minute being used for jacket cooling. I suggested that he put a bend in the exit pipe so that the water would be projected upward before dropping into the sump. The formula was applied and a graduated scale based on the formula was made and placed close to the jet. The scale is direct-reading, the height of the jet giving the gallons per minute over a wide range. The jet was projected to a height of 5 inches and the flow caught in a calibrated vessel. Actual measurement showed the flow to be 5¼ gal. per min., while the formula gave the flow as 4.95 gal. per min., which, of course, is close enough for all practical purposes. The slightly greater actual flow is chargeable to three principal causes, as follows:

1—The small air resistance to the low velocity;
2—Difficulty in making perfect measurement of the height of the jet;
3—The slight variation from the vertical of the jet.

The "efficiency" of the above formula might be given as the ratio between the computed gallonage and the actual flow. Thus in the last instance we would have 4.95 gal. divided by 5.25 gal. or an efficiency of almost 95 per cent. In general, I dare say, the efficiency for small jets and low velocities such as those would always be between 95% and 100%.

—*W. F. Schaphorst, M.E.*

A man brought some sausages and asked his landlady to cook them for his breakfast.

"How'll I cook them?" she asked.

"Fry 'em like fish." replied the lodger.

The next morning, when the landlady served them, she remarked: "I hope you'll enjoy your breakfast, sir; but there's not much in these things when they're cleaned out."

Equipment You Ought to Know About

(Continued from Page 510)

tor is entirely new in that it has been built with the motor frame and end brackets of solid castings for this special class of service. The cast iron, of thick cross section, is inherently resistant to rust and corrosion. Even the conduit box is made of cast iron so that there are no exposed sheet steel parts to be attacked by corrosion. A baffle plate cast integral with the inner side of the motor bracket prevents splashing liquids from reaching the motor windings. This motor may be used outdoors the year round without any additional protection. The splash-proof motors are rated 50° continuous and are offered in both the squirrel-cage and wound-rotor types.

New Heavy Sinker Drill

CHICAGO Pneumatic Tool Company, 6 East 44 Street, New York City announces a new heavy sinker drill, the CP-52, weighing 80 lbs. and having a 3-inch cylinder. This drill is offered for long hole quarry drilling and in broken "ravelly" formations where fast drilling speed, strong rotation and exceptional hole cleaning are required. According to the manufacturer the CP-52 is symmetrical, well-balanced and, being fully cushioned and valve-actuated, maintains its drilling speed under varying air pressure and does not fog or "freeze" with wet air. The valve is rugged, fast and positive in action, giving powerful rotation. Housed in a renewable case within the cylinder, bushings at points of wear, and automatic lubrication, insure long life and low maintenance. Effective continuous and emergency blowing keeps the hole clear of cuttings. For hard ground and short holes, where continuous blowing is unnecessary, the CP-52 can be equipped with an air rod in place of the air tube. A sturdy, forged, spring-cushioned retainer effectively holds and pulls the steel and it is easy to operate.

Tests in various sections of the country are reported to show the CP-52 to have high drilling speed over a wide range of formations, good holding qualities. Holes are said to be kept clear of cuttings to a depth of 25 to 30 feet.

The CP-52W (Wet) sinker, identical in make-up with the CP-52, except for minor details, is available where wet drills are required. The change from dry to wet, and vice versa, is quickly and easily made.

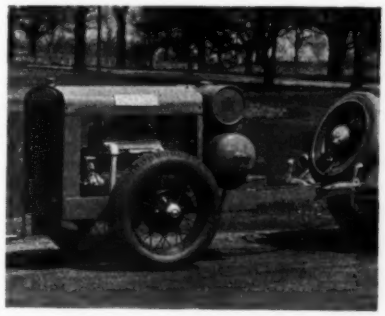
New Process for Removing Oil or Grease

ACCORDING to an announcement by Magnus Chemical Company of 22 South Ave., Garwood, N. J., they have introduced a new product, Magnusol, for cleaning motor blocks, gears and machinery in maintenance work. They state Magnusol completely removes all oil, grease, smut, pigmentss, abrasives and other insoluble dirt from the metal surfaces quickly and thoroughly and at a lower cost than any other method. Magnusol is in liquid form and is harmless to user and article being cleaned.

Schramm Utility Compressors

SCHRAMM INC. of West Chester, Pa., announces the addition of a new, compact, lightweight compressor to be known as the "Utility" type to their complete line of single and two-stage portable compressors. Built in two sizes, these outfits are mounted on two wheel pneumatic-tired trailers, either with or without springs, and are especially adapted to the requirements of the contractor who has a number of small jobs requiring a minimum amount of air power. One man can easily handle the compressor on the job. He can pull it from place to place on short hauls. It can quickly be coupled with motor car or truck and transported at speeds up to 35 m.p.h.

These "Utility" Compressors are complete plants, with air receiver, radiator cooling system,



automatic unloading control, and are protected with steel hood and side doors that can be padlocked. Drop leg supports serve to stabilize the compressor when it is in operation.

The two sizes available are the model 25 (18 cu. ft. actual air delivery) and the model 55 (38 cu. ft. actual air delivery).

New G-E Welding Electrode Produces High-Quality Welds

A NEW heavily-coated arc-welding electrode, designated as G-E type W-23, for the economical production of high-speed, high-quality welds in the flat position, has been announced by the General Electric Company. Type W-23 electrodes are suitable for either manual or automatic arc welding and will produce equally good results on either alternating or direct current. With the latter, reverse-polarity is used.

Type W-23 electrodes operate at higher speeds, in larger diameters (¼, 5/16, and ⅜ inch), and at higher current values than those commonly in use. Another economy-promoting characteristic is the fact that type W-23 welds fuse uniformly with the side walls of the joint—thus saving the time and labor ordinarily spent in chipping out slag from pockets at the line of fusion. On most work, the production rate with type W-23 is two to three times the rate with bare or lightly fluxed electrodes.

Type W-23 arc-welding electrodes are recommended for the fabrication of pressure vessels, pipe, machinery, and all types of joints where welding can be carried out in the flat position.

SHOTS *from the Firing Line*

Low Bidders Announced on 110 Miles of Aqueduct

By K. CAMPBELL

METROPOLITAN Water District of Southern California opened bids October 11 for the construction of 110 miles of canals, conduits and siphons on the Colorado River Aqueduct. The work was divided into 16 schedules. Bids were received from a total of 29 contracting firms. Based on the total of the sixteen low bids the cost of constructing this portion of the Aqueduct will amount to $14,125,175. The apparent low bidders, their sections and bids are as follows: Hanrahan Company, Yondall Construction Company, Elliott, Stroud Brothers and Seabrook, Charles Harlow and C. M. Elliot, of Pasadena, bidding jointly, were low on Schedule 1 at $1,036,774, Schedule 10 at $819,504, Schedule 11 at $973,227 and Schedule 13 at $632,037; Barrett & Hilp and Macco Corporation of Clearwater were low on Schedule 2 at $1,094,991, Schedule 3 at $974,754 and Schedule 7 at $853,460; Jahn & Bressi Construction Company of Los Angeles were low on Schedule 4 at $704,318 and Schedule 5 at $715,057; C. W. Wood and M. J. Bevanda of Stockton were low on Schedule 6 at $400,884 and Schedule 8 at $881,716; Utah Construction Company of San Francisco was low on Schedule 9 at $955,248; Three Companies, Inc. of Denver were low on Schedule 12 at $1,313,272, and Thompson-Starrett Company of New York City were low on Schedule 14 at $926,961, Schedule 15 at $1,028,046 and Schedule 16 at $814,921.

The completion of these 16 schedules will involve approximately 19,000,000 yards of common excavation, 830,000 yards of rock excavation, 1,400,000 yards of concrete and 88,400,000 yards of steel reinforcement.

Crushed Stone Production Declines in 1933

A REPORT ISSUED by the Bureau of Mines states that the quantity of crushed stone sold or used by producers in the United States in 1933 amounted to 45,490,610 short tons, a drop of 13 percent from 51,995,100 short tons in 1932. This total includes 40,857,120 tons of stone used in concrete work and road surfacing, a decrease of 15 percent from the comparable figure for 1932, and 4,633,490 tons of railroad ballast, 17 percent more than in 1932.

Despite stiffening of prices at the close of the year as the result of operation under the code the average net sales realization dropped from $0.90 a ton in 1932 to $0.86 in 1933. The average value of stone used in concrete work and road surfacing decreased from $0.91 to $0.88, and for railroad ballast from $0.82 to $0.69. The total value of all crushed stone sold or used in 1933 amounted to $39,018,736, a decline of 17 percent from 1932.

The trend from rail to truck shipments continued in 1933. More than 60 percent of all crushed stone (excluding railroad ballast) was transported by truck in 1933, compared with 58 percent in 1932. Virtually all noncommercial production in 1933 came from truck-shipping plants, and nearly 52 percent of the output of commercial operations also was shipped by truck.

Bids Asked on Rye Patch Dam

THE BUREAU of Reclamation will receive bids November 12 at Lovelock, Nevada, for the construction of Rye Patch Dam. The principal items of work are; 354,200 yards of open cut excavation, 3000 yards of tunnel excavation, 215,000 yards of earth and 25,000 yards of rock fill in embankment and the placing of 7,340 yards of concrete. Certain materials will be furnished by the government. The project must be completed within 400 calendar days after starting.

Snare Corporation Low Bidder on Tygart Dam

FREDERICK SNARE Corporation, New York City submitted low bid of $6,305,773 October 11 for the construction of the Tygart River Reservoir Dam near Grafton, W. Va. The government estimate was $7,137,737.

Three Dams in Muskingum Watershed to be Let in November

THE ZANESVILLE District Engineer's office at Zanesville, Ohio, has announced that bids will be opened on November 13, 15 and 21 for the construction of three of the dams comprising the flood control and water conservation program for the Muskingum Watershed Conservancy District. These dams are the Wills Creek Dam on Wills Creek, the Charles Mill Dam on Black Fork, and the Tappan Dam on Little Stillwater Creek.

The Tappan Dam to be let November 13 is 9 miles southeast of Dennison, and one mile downstream from the Tappan Post Office, and will be of rolled earth-fill construction. The dam will be approximately 1400 feet long. Concrete key walls will be used to tie the embankment into rock at each abutment. The upstream slope of the embankment will be protected with hand-placed rip-rap. The outlet structure will be located on the left abutment, and will consist of a tunnel approximately 480 feet long and a concrete conduit approximately 90 feet long. The spillway channel will be a cut approximately 650 feet long and will average approximately 75 feet in width. It is estimated that it will require approximately 1 year to construct this dam.

The Charles Mill dam, to be let November 15 is 13 miles northwest of Loudonville and ½ mile upstream from Charles Mill, and will also be of rolled earth fill construction. The main dam will be approximately 1350 feet long, with a maximum height of approximately 53 feet. In addition to the dam, two small dikes will be required in shallow saddles to the right of the main valley. Dike number 1 will have a maximum height of 35 feet and will be 1400 feet long. Dike number 2 will have a maximum height of 25 feet and will be 300 feet long. The spillway channel will be 1100 feet long and will average 65 feet wide. It is estimated that this dam will be completed in approximately one year.

The Wills Creek Dam, which will be let November 21, is about 7 miles south of Coshacton, Ohio and 5 miles above the mouth of Wills Creek. This dam will be of rolled earth-fill construction, approximately 2000 feet long with a maximum height of 85 feet. Both slopes of the embankment will be protected with dumped rip-rap. The outlet structure will consist of two concrete conduits located on the left abutment. Conduits will be approximately 250 feet long, 15 feet high and 20 feet wide. The spillway channel will be approximately 1200 feet long and average approximately 50 feet in width. It is estimated that it will take approximately two years to complete this dam.

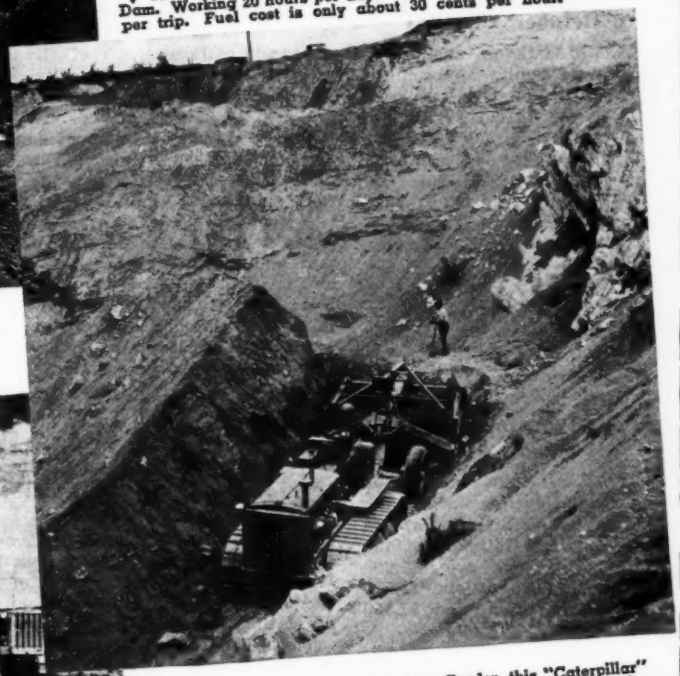
Cement, reinforcing steel, and outlet gates will be furnished by the Government. There are listed below some approximate quantities that will be involved in the construction of the three dams. In addition to these items, various other items of equipment, supplies, and material will be required.

Item	Approximate Quantities		
	Wills Creek	Tappan	Charles Mills
Embankment	500,000 C.Y.	370,000 C.Y.	380,000 C.Y.
Excavation:			
Earth	285,000 C.Y.	90,000 C.Y.	40,000 C.Y.
Rock	96,000 C.Y.	80,000 C.Y.	25,000 C.Y.
Concrete	30,000 C.Y.	4,500 C.Y.	10,000 C.Y.
Rip Rap:			
Hand Placed	7,000 C.Y.	6,900 C.Y.	-0-
Grouting	500 Ft.	300 Ft.	350 Ft.
Coffer Dams	20,000 C.Y.	5,000 C.Y.	11,000 C.Y.

AMERICA GOES DIESEL

•AMERICA GOES DIESEL•

▲ This bulldozer-equipped "Caterpillar" Diesel Seventy-Five Tractor supplies low-cost, dependable power to Contractor Clarence Young for a mountain road building job near Butte Meadows, California.



▼ This is one of three "Caterpillar" Diesel Seventy-Five Tractors on Mr. R. Roland's contract at Coulee Dam. Working 20 hours per day. Moving 11 to 12 yards per trip. Fuel cost is only about 30 cents per hour.

◀ Pulling a "Caterpillar" Elevating Grader, this "Caterpillar" Diesel Fifty Tractor is doing canal construction work for the Irrigation Department of the Union of South Africa.

•AMERICA GOES DIESEL•

AMERICA GOES DIESEL

"SO WE INCREASED OUR FLEET OF 'CATERPILLAR' DIESEL TRACTORS"

—SAYS H. W. McKINLEY, GLENDALE, CALIFORNIA, CONTRACTOR, AFTER HIS COST RECORDS SHOWED THAT THREE BIG "CATERPILLAR" DIESEL TRACTORS WERE COSTING LITTLE MORE FOR FUEL THAN ONE 30-HORSEPOWER GAS TRACTOR.

Another southern California contractor, Clarence Crow, of Crow Brothers, writes: "Our fuel cost for each of our 'Caterpillar' Diesel Seventy-Five Tractors is only one-fifth of what it used to be for our big gas tractors."

Other owners, everywhere, report similar results. Says E. B. Boyle, President of the Boyle Road and Bridge Company of Sumter, S. C.: "Fuel for the 'Caterpillar' Diesel costs us less than 1/3 the cost of fuel for a gas machine of the same size." From Pickering, Mo., Mr. L. O. Killion writes: "Ten to twelve gallons of fuel is driving the Diesel Thirty-Five the same number of hours that 25 gallons of gasoline did the gas 30-h. p. tractor, besides doing one-half more work."

More work—less cost—such are the results reported by the thousands of enthusiastic owners of "Caterpillar" Diesel Tractors and Power Units. That explains why more and more users of tractors and stationary power are going Diesel—with "Caterpillar." Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

For your convenience in writing to Caterpillar Tractor Co., you will find a card bound in this issue.

Shots From the Firing Line—*Continued*

Progress on Public Works Highways to October 20, 1934

PROGRESS MADE on emergency construction of public works highways to October 20 under the supervision of the U. S. Bureau of Public Roads shows a total of 606 projects, estimated to cost $30,214,000, approved but contracts not yet awarded; 476 projects, estimated to cost $14,913,000, awarded but not yet under construction; 2,824 projects, estimated to cost $183,501,000, under construction; and 5,837 projects completed at a cost of approximately $239,375,000. The 2,824 projects under construction involve 7,978 miles of road and are giving regular direct employment to 174,953 men.

Gallipolis Dam to be Let November 20

IT IS EXPECTED that bids will be received about November 20 for the construction of the Gallipolis Dam in the Ohio River near Gallipolis, Ohio. Principal items of work are 117,000 yards of common excavation, 13,500 yards of rock excavation, and 87,500 yards of concrete.

Government Building Highway Connecting Historic Areas

THREE AREAS of unusual interest in our colonial history are being linked together by a parkway now under construction in the Colonial National Monument.

The parkway connects Yorktown, Virginia, where our colonial period came to an end with the defeat of Cornwallis in 1781, and Williamsburg, another city of colonial fame. Eventually it will end at Jamestown Island, where, in 1607, the first permanent English colony was established in America.

Four separate agencies of the Federal Government are cooperating on this project. The National Park Service is primarily responsible for the location. The Bureau of Public Roads is in charge of the actual road building, which is being done under Government contract.

Most of the money is coming from two agencies of the New Deal—Public Works Administration and Emergency Conservation. Of the total of over $1,200,000 allotted to the parkway to date, only $158,345 came from regular National Park Service appropriations. Early emergency relief funds furnished $509,900, and $546,710, the largest allotment, came from Public Works.

The parkway so far constructed consists of a three-lane highway, of concrete with exposed aggregate. In order that the colored pebbles of the concrete may show in the finished surface, the concrete is treated with acid, then gone over while still damp with a wire brush. This exposes the pebbles, giving a more natural and attractive appearance to the roadbed.

On either side of the roads the area is being restored to natural conditions. The width of the parkway generally is 500 feet. This new highway, for nearly two miles of its length, is located along the sandy cliffs of the York River. To prevent erosion of these cliffs, intensive control has been undertaken with the help of C. C. C. labor. Bulkheads made of salvaged timber hold the terraced slopes in place, with dead brush placed between the pilings to form a temporary mat. Over the banks brush and other vegetation has been planted, to form a permanent heavy mat which will control slope slipping and erosion.

Already 10,000 trees and shrubs have been planted along the parkway and others will follow as the roadway is pushed toward its ultimate destination. Where the road leaves the riverfront, to pass through wooded stands, interesting vistas have been cut, giving a glimpse of the blue waters beyond.

Dam No. 16 to be Let November 27

BIDS WILL be received November 27 by the U. S. Engineers at Rock Island, Ill., for the construction of Dam No. 16 in the Mississippi River, near Muscatine, Iowa.

The dam will be 3,940 feet long. The principal items of work are 75,000 yards of common excavation, 775,000 yards to be dredged, and about 60,000 yards of concrete.

Large Machinery Contracts Awarded by Grand Coulee Dam Builder

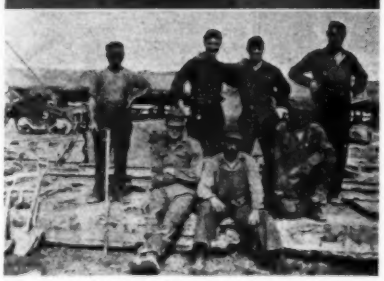
By GRACE KIRKPATRICK

THE MASON-Walsh-Atkinson-Kier Company, building the first unit of the Grand Coulee Dam, has awarded well over $3,000,000 in equipment contracts to date. Some of the largest ones are: a $750,000 lubrication and fuel contract to the Standard Oil Company through the Coulee Trading Company, a merchandising subsidiary of the M-W-A-K Company; to the Jeffrey Manufacturing Company an order for a $300,000 conveyor which will carry 11,000,000 yards of gravel into Rattlesnake gulch on a mile-long belting system; a $200,000 contract involving the construction of 350 houses and buildings, a water supply and sewage disposal contract amounting to $150,000 besides $30,000 spent for plumbing supplies; and $50,000 for power and light transformers from Allis-Chalmers Manufacturing Company.

In addition hundreds of thousands of dollars will be paid out on contracts of unannounced amounts for large electrically operated power shovels from Bucyrus-Erie Company of South Milwaukee, Wisconsin, and the Marion Steam Shovel Company of Marion, Ohio; trucks and passenger cars from General Motors; tires from United States Rubber Products Company; also for about 1,500 Graybar electric heaters which will be used in Mason City, the first all-electric city built for the contractors' men.

Canada

Quebec Notes



Operator Pat Doucet sent us these pictures of a Bucyrus-Erie 175-B dragline and the crew that runs it at work on the 16-mile Beauharnois Canal project. The construction of this power project on the St. Lawrence River was described in the August 1930 issue of *Excavating Engineer*.

The 175-B, according to Mr. Doucet, dug many million yards on the Welland canal before being purchased by the **Beauharnois Construction Company** in 1929. Since then it has been working on the Beauharnois project digging in boulder clay to a depth of 26 feet in water. The machine carries a 5-yard bucket and loads on an average of 200 20-yard cars in 24 hours.

In the lower picture is the operating crew of the 175-B dragline. From left to right, top row: Engineer Rupert; Oiler, C. Doucet; Electrician, Burke; and Operator, P. Doucet; bottom row: Pitmen, St. Onge Daoust, and Filiatsault.

New England Notes

McClintic-Marshall Corporation of Bethlehem, Pa., received an award in September to construct steel superstructure of a bridge over Saugus River between Lynn and Revere, Mass., for $540,907.

Save time and money WITH *Loadmaster*

A life-saver in time and money, the Loadmaster hustles in where other cranes cannot go. Mounted on wheels, and having no tail swing, it can operate in an opening only 5′ 7″ wide and 8′ 9″ high. This mobile and efficient crane is easily operated by one man and lifts, swings, carries, and places loads up to 5,000 pounds. There is also the CT-50 Loadmaster with capacity of 13,900 pounds.

Simplicity of construction gives strength . . . from the full-revolving boom to the sturdy axles.

On many jobs Loadmaster has paid for itself in 60 to 90 days—and gone on to give long service with pure profit. Available with wheel or crawler mounting. Write now for full information about the savings Loadmaster can offer you.

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

BUCYRUS ERIE

LOADMASTER

Excavating, Drilling & Material Handling Equipment

854

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

Shots From the Firing Line—*Continued*

Central Construction Company of Lawrence, Mass., was low bidder on the Falls bridge over the Merrimac River in Lawrence for $175,900.

J. Leopold & Company of New York City was low bidder on the bridge over Blackstone River, Providence, R. I. with a price of $109,906 for the substructure and $205,580 for the superstructure.

New York Notes

By G. E. PETERSON

State Highway lettings since September 25 have included the following jobs; **C. D. Murry Inc.**, Syracuse, $94,722 for 2.0 miles of 20′ concrete in Cortland County and $19,628 for 5.54 miles of gravel surfacing in Onondaga County; **Peckham Roads Construction Co.**, White Plains, $7,086 for a culvert in Delaware County; **Madison County Construction Co.**, Solsville, $252,709 for 7.64 miles of 20′ concrete in Herkimer County; **Blacktop Paving Co.**, Watertown, $12,299 for bridge in Jefferson County; **Dale Engineering Co.**, Utica, $161,263 for 4.66 miles of 20′ concrete in Madison County; **J. F. Paddleford**, Sherburne, $27,969 for bridge and approaches in Chenango County; **Good Roads Eng'r and Contr. Co.**, Wantagh, L. I. $137,562 for grade separation at Farmingdale, L. I.; **A. L. Blades**, Hornell, $33,816 for 6.37 miles of gravel surfacing in Steuben County; **Manstin Eng'r Corp.**, Napanoch, $88,571 for bridge and approaches in Orange County; **John Bellardino**, Seneca Falls, $164,225 for 5.27 miles of 20′ concrete in Ontario County; **D'Onfro Bros.**, Leominster, Mass., $151,631 for 3.50 miles of 20′ macadam in Warren County; **Utica Const. Co.**, Utica, $77,355 for 3.79 miles of variable width macadam in Herkimer County; **M. E. Colle**, Leroy, $23,821 for 4.42 miles gravel in Ontario County; **Leonard J. Gates**, Cape Vincent, $42,869 for bridge and approaches in Jefferson County; **Wm. Van Kleeck**, New Paltz, $64,662 for bridge and approaches in Greene County; **Warren Bros.**, Cambridge, Mass., $241,383 for 4.11 miles of variable width concrete in Chemung County,—this job includes 126,300 yards of excavation and will be handled by the **Dalyrmple Bros. Co.** of Elmira; **Thos. A. Brogan**, Yonkers, $351,362 for 8.08 miles of 20′ concrete in Dutchess County; **John Tata**, Buffalo, $38,494 for bridge in Erie County; and **Manitou Const. Co.**, Rochester, $168,698 for 2.99 miles of 30′ concrete in Wayne County.

JOHN RUST

It is with regret that we report the sudden death of John Rust of Indian Lake. Mr. Rust was well known among the contracting trade and his death will be keenly felt by those who knew him.

George Heiner of the Kalman Steel Co. has changed his headquarters from Albany to Buffalo. George, however, says he will be at all the Albany lettings so as to keep in contact with all his old friends in the contracting industry.

We are glad to report that **Pearl McCochrane** is back at her old job in the L. L. Gowdy office in Albany after several weeks of illness.

Hank and Ed Dalrymple of Elmira spent a few days in New York the week of Oct. 15 visiting friends and doing a little equipment shopping on the side. Hank had the misfortune to drop a caterpillar link on his toes recently and so was navigating rather painfully.

New Jersey Notes

The U. S. Bureau of Public Roads has approved the State Highway Commission's program for the expenditure of $8,746,879 during the remainder of the year and next year for the **construction of roads and bridges** and the purchase of rights of way.

George M. Brewster & Son, Inc. of Bogota received award to pave 1.33 miles of highway in Passaic County for $118,021.

Pennsylvania Notes

Sweeney Bros. of Scranton submitted low bid of $208,035 for the construction of a concrete arch bridge in Scranton.

By D. W. EVANS

Carey, Baxter & Kennedy, Inc., of New York are stripping coal near Mahanoy City with a 10-yard Bucyrus-Monighan walking dragline for the Philadelphia & Reading Coal & Iron Company. W. E. Conroy has charge of this job for the contractors, and also supervises two other jobs, one at Mayfield and one at Forest City, in the anthracite district. This 10-yard dragline shown in the accompanying photograph is the largest of its type

ever to invade this district, yet it is just as fast as the smaller walking draglines owned by these contractors, and they are more than satisfied with its performance.

The typical coal-stripping job in the anthracite district of Eastern Pennsylvania has at least one excavator for stripping and another for loading the coal. Here is an exception discovered on a stripping project of **Dick Construction Company** of Hazelton, the job being just outside of Sheppton. This versatile Bucyrus-Erie 43-B is used alternately for stripping and for coal loading. At the time of our visit it was just being changed over from a shovel to a dragline.

West Virginia Notes

Southern Stone Company of Roanoke, Va., received award to construct a 6.8-mile road project in Mingo County for $45,803.

R. Giavina of Huttonsville was low on a 6-mile road project in Calhoun County with a bid of $62,142; **Hatfield Construction Company** of Huntington, was low on 5.1 miles of concrete pavement in Layette County, bid $135,118; **Loesch & Green Construction Company** of Cleveland, low on 7.2 miles of concrete pavement in Jackson County, bid $141,018; **Price Construction Company** of Huntington, low on 8.3 miles of concrete pavement in Mercer County, bid $204,773; and **W. D. Wilson & Sons** of St. Mary's low on 3 miles of concrete pavement in Pleasant County, bid $63,134.

North Carolina Notes

An allotment of $90,000 to the War Department for the construction of a bridge across the Intracoastal Waterway at Fairfield, was recently announced by the Public Works Administration.

South Carolina Notes

The Federal Aid projects under the **$9,403,000 biennial program** approved by the State Highway Commission, Columbia, includes 347.66 miles of bituminous surfacing, 9 bridges and approaches, and 46.10 miles of concrete, in 44 counties.

Georgia Notes

Arundel Corporation of Baltimore received award from the War Department to construct the Savannah Bluff lock and dam in the Savannah River for $977,309.

The following low bids were received by the State Highway Department: 4.5 miles of paving in Camden County from **Broadbent Construction Company** of Ocala, Florida for $44,276; .36 miles of concrete pavement in Cherokee County from **A. Lyons** of Rogersville, Tenn., for $69,760; 2.8 miles of paving

Here is Wire Rope That Can Take It and Come up Smiling

"HERCULES" RED STRAND WIRE ROPE — REG. U.S. PAT. OFF.

When you need wire rope that can be depended upon for long, trouble-free, economical service, remember Hercules (Red Strand) Wire Rope "Can Take It and Come up Smiling" no matter how severe the service requirements are.

The Hercules (Red Strand) line is complete . . . Furnished in Round Strand, Flattened Strand, Steel Clad, Preformed and Non-rotating construction in all sizes to meet all working conditions and requirements. It is made from the highest quality open-hearth steel wire . . . every strand rigidly tested to meet the exact requirements for strength, toughness, flexibility and wearing qualities.

Specify Hercules (Red Strand) on your next wire rope order . . . you will get better service and save money.

Made only by

A. Leschen & Sons Rope Co.

Established 1857

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New York · · · 90 West Street
Chicago · 810 W. Washington
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Made of Acid Open Hearth Steel Wire

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

Shots From the Firing Line—*Continued*

in Clayton County from **Beckhan-Lawler Construction Company** of Perry for $34,307, 5.3 miles of grading and culverts in Cobb County from **C. M. Lyle Construction Company** of Gainesville for $51,962; 5 miles of grading in Columbia County from **G. W. Lakey** of Thomson for $35,729; 3.4 miles of grading in DeKalb and Fulton Counties from **Nicholas Contracting Company** of Atlanta for $60,307; and .3 mile of paving and 1 bridge in Fulton County from **Northeastern Construction Company** of New York City for $167,026.

Michigan Notes

Remus Construction Company of Remus received award on a .7 mile road project in Kent County for $50,052.

Gould & Cross of Grand Rapids were awarded a paving project in Montmorency County for $35,129.

The State Highway Commission received the following low bids: 5.2 miles of paving in Kalamazoo County from **Brooks Construction Company** of Jackson for $120,929; a grading and paving project in Ottawa County from **West Michigan Construction Company** of South Haven for $120,653; .6 miles of grading and paving in Calhoun County from **Grace Construction & Supply Company** of Marshall for $88,459; and 1.5 miles of grading and paving in Macomb County from **Taylor Brothers, Inc.** of Birmingham for $55,706.

Operator Frank Burke writes that he has moved from Rising Sun, Maryland, to Wyandotte where he is running a Marion 371 gasoline dragline for **Arundel Corporation** of Baltimore on the Livingston Channel job. In addition, the contractor is operating a Bucyrus-Erie 320-B dragline and 14-B shovel on this six-mile project involving 2,600,000 yards of excavation.

Wisconsin Notes

Spencer, White & Prentis, New York City has been awarded a contract to construct Dam No. 6 on the Mississippi River, near Trempealeau. The contract price is $1,668,442.

Illinois Notes

Powers-Thompson Construction Company of Joliet was low October 10 with a bid of 23c a yard for dredging a channel in Treat's Island in the Illinois River near Joliet. Approximately 182,500 yards of excavation are involved.

By A. J. KOENIG

The following low bids were received October 10 by the State Highway Commission; Route 4, St. Clair County, 0.05 mile paving approaches to municipal bridge, **John Meckler & Co.**, $22,885; Route 12, Marion County, widening Salem bridge, **H. R. Cawood**, $84,606; Route 134, Edgar County, 0.65 mile paving approaches C.C.C. & St. L. R. R. **Bishop Construction Co.**, $21,018; Route 150, Alexander County, 6.60 miles paving, **Egyptian Construction Co.**, $178,347; Route 156, Monroe County, 2.66 miles paving, **Edwardsville Construction Co.**, $63,287; and Route 161, St. Clair County, 0.86 mile paving, **Maurice Hoeffken & Co.**, $30,544.

St. Louis and Vicinity

By A. J. KOENIG

Bids were received September 28 on 41 highway projects at Jefferson City. Among the low bidders on the larger items were: **Service Construction Company** with a bid of $202,429 for eight miles of grading and 20-foot concrete slab in Butler County; **Imperial Construction Company** $148,477, 4.079 miles of grading and 20-foot concrete slab in Clay County; **Kelly & Underwood**, $100,219, 3.082 miles of grading and 30-foot concrete slab in Jasper County; and **M. E. Gillioz**, $293,519, bridge in Jackson County.

A contract for the construction of the new Carondelet boulevard in the southern part of St. Louis was let to the **Webb-Boone Paving Company** on their low bid of $40,485, this bid being 35 percent lower than the City Engineer's estimate. The new road will be of concrete 20 to 24 feet in width and about one mile long. Webb-Boone Company was also awarded contract by the East St. Louis, Illinois City Council for repaving State Street on their bid of $27,463.

W. F. Riley & Son, Inc. have contract laying water mains in Lawton and Bremen Ave. in St. Louis.

M. E. Gillioz has contract for the construction of a sewer in Jordan Valley Drainage District, Springfield.

Perry McGlone has contract for sewage disposal plant in Marshall.

The City of Washington awarded a contract for the substructure of the concrete and steel bridge across the Missouri River to **Missouri Valley Bridge & Iron Co.**, at $212,188. The contract for the super-structure went to **Stupp Bros. Bridge & Iron Co.**, their bid being $345,483.

River Notes

Vicksburg District

At the letting held October 2, **W. F. Elkas** of Leota Landing, Miss., was low with a bid of 24.7c per yard on the 100,000-yard Vaucluse Enlargement Levee, and 21.7c on the120,000-yard Grand Lake Levee; **Kochtitzky & Johnson** of Forest City, Ark., were low with bid of 17c on the 77,000-yard Elton Slough Levee; **Robinson & Young** of Baton Rouge were low with a bid of 18c on the 105,000-yard Willow Point Levee. At the same letting **Council & Lewy Company** of Greenville, Miss. submitted low bid of 16.43c on 1,168,000 yards (3 sections) of levee. **Louisiana Materials Company** of New Orleans was low on 224,000 yards at 22.7c. Four levees, Rosedale, Bolivar, Catfish, and Oshbrook were involved.

T. L. James & Company and **Guilliams Bros.** of Ruston, La., were low on 782,800 yards in the Halpino Levee at 15c. **Driver Construction Company** of Memphis were low on 671,000 yards in the Brunswick Levee at 16.4c.

New Orleans District

Joe W. Hendrix of Alexandria, La., was low October 5 with a bid of 8.74c on 115,000 yards in the Lower Beaver Levee.

Standard Dredging Company of New York City submitted low bid October 9 of 42.47c per yard on 1,260,000 yards in the Bayou Sorrell—Bayou Long Levee.

L. E. Harris of Ferriday, La., was low October 12 with a bid of 19.83c per yard on 1,900,000 yards in the Ramah-Grand River Levee.

Texas Notes

RFC has announced a **loan of $902,500** to the Hidalgo County Water Control and Improvement District No. 1.

Sternberg Dredging Company of St. Louis received award to dredge 3,136,500 yards from the Houston Ship Canal for $545,751.

Oran Speer of Alvord was awarded a 29-mile road job in Gray County for $231,890.

Nebraska Notes

W. S. Hardwick of Memphis, Tenn. was low October 19 with a bid of 5.24c per yard on 2,500,000 yards of channel excavation on the Loup River power project.

Minneapolis Bridge Company of Minneapolis received award to construct a bridge over Missouri River between Omaha and Council Bluffs for $2,075,000. The bridge will have two 421-foot river spans on concrete piers and a 4000-foot approach.

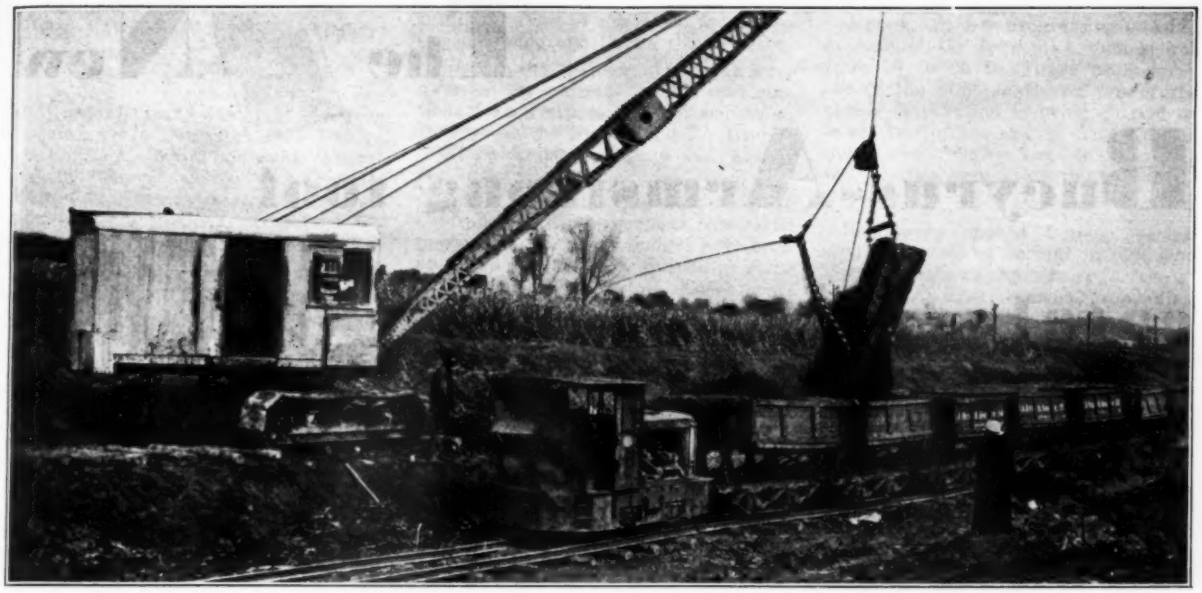
Colorado Notes

C. Owen of Denver submitted low bid September 5 of $100,166 on a 12-mile road project in Elbert County.

By H. M. BIBAUD

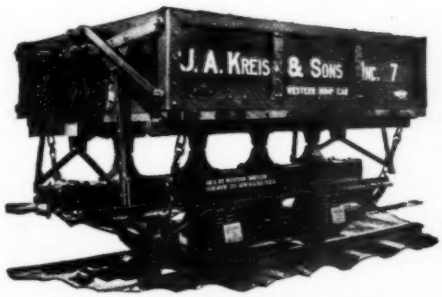
The first semi-annual convention of the **Canada-Mexico Highway Association** was held in Gallup in September. Delegates from five states were present. The association has proposed a Federal trunk route to be numbered U. S. Highway 87, and passing through Montana, Wyoming, Colorado, New Mexico, Arizona to Nogales, Old Mexico. At this time U. S. Highway 87 is designated through Montana and Wyoming, that number ending north of the Colorado line.

It is proposed to extend the numbering down the west slope of Color-



Western 5-yard heavy duty Dump Cars on the levee work of Keeley Bros. Contracting Co. near East St. Louis, Illinois

IF IT IS A JOB FOR DUMP CARS IT IS A JOB FOR WESTERNS



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Shots From the Firing Line—

Continued

ado through Grand Junction, Montrose, Dolores, Cortez; through New Mexico, via Shiprock, Gallup and Zuni; through Arizona via St. Johns, Springerville, Clifton to Nogales where the International Pacific highway traverses Old Mexico.

National officers of the association are Peter Riley, Clifton, Arizona, President; W. V. Olin, Cortez, Colorado, Secretary; and R. P. Ketner, Gallup, New Mexico, Treasurer. Headquarters for the association have been opened at Cortez, where the National Secretary resides.

Hamilton and Gleason of Denver were low bidders at $107,500 on the oiling of a 12-mile stretch on Berthoud Pass on U. S. Highway 40.

Garner Brothers of Longmont were low with a bid of $115,087 on a 5.7-mile gravel surfacing project near Elk Springs in Moffat County.

The $193,795 bid of the **Driscoll Construction Company** of Pueblo was low for 15.59 miles of gravel surfacing between Pueblo and Canon City.

Horner and Switzer of Denver were awarded the contract for the construction of an overpass and approaches at Dotsero on the Denver and Rio Grande Western Railroad with a low bid of $96,576.

Nearly **a million dollars worth** of Colorado highway projects contained in the last emergency budget have been approved by the U. S. Bureau of Public Roads in Washington. These projects are on main arterial roads either within cities or outside. Bids have been advertised for according to highway officials. Engineering surveys are ready on all the projects. It is believed that construction can be started on many of the projects before winter weather.

A request that the Government allot funds for work on Caddoa Dam has been placed before the President and Harold L. Ickes, Public Works Administrator, in the form of a resolution adopted at Pueblo at the Caddoa Dam rally.

Fort Peck Dam Notes

Over 1,500,000 yards of dirt have been moved by the **Mason & Walsh Company.** Work is progressing steadily in each of the four pilot tunnels and from 10 to 25 feet have been taken out of the pilot shafts on top of the bluffs. Excavation is being carried on in all four of the shafts. The illustration below shows two Bucyrus-Erie 43-B shovels excavating the tunnel approaches.

Bids were opened October 16 on **600,000 barrels** of cement in bulk and **35,000 barrels** in paper bags for use at the dam. Five cement companies, Huron Portland Cement Company of Detroit, Lehigh Portland Cement Company of Chicago, Universal Atlas Cement Company of Chicago, Northwestern States Portland Cement Company of Mason City, Iowa, and Three Forks Portland Cement Company of Denver submitted identical delivered prices of $2.5054 per barrel in bulk and $2.7145 per barrel in paper bags.

The **pumping of hydraulic fill** for the dam has been started and is now being carried on 24 hours a day. The two giant motors on board the floating cutter-head dredge "A" started a 28-inch stream of sand and water through the two Bucyrus-Erie centrifugal pumps.

Shots From the Firing Line— *Continued*

After two days of slow, careful operation, the long pipeline was attached and material began pouring into the dam on October 13. Three other dredge units will be completed during the winter and will be ready for operation in the spring of 1935.

South Dakota Notes

By LISLE REESE

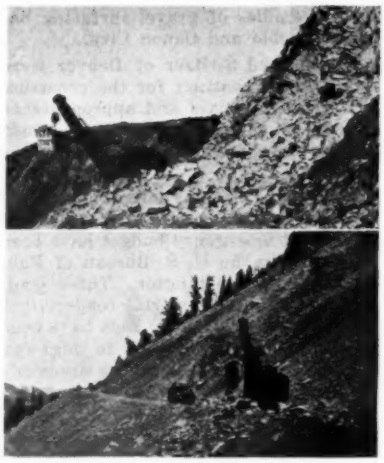
Contracts amounting to $350,000 for road and bridge construction have been awarded by the Highway Commission for winter projects. The projects include 64 miles of grading, four bridges, 68 miles of gravel surfacing, 35,000 feet of guardrail and 31 miles of resurfacing. The grading contracts were awarded as follows: $72,210 for 18.012 miles west of Watertown, and $31,465 for 12.343 miles south of Ipswich to **Jarvis Wright and Howell**, Sioux Falls; $38,375 for 12.144 miles west of Madison to **C. W. McNamara**, Sioux Falls; $33,739 for 5.797 miles in northwestern Yankton County to **Dave Gustafson**, Sioux Falls; $20,243 for 8.336 miles south of Artas to **H. J. Hawley**, Aberdeen; $10,837 for 4.404 miles north of Burke to **Marse and Clinkerbead**, Valentine, Neb.; and $15,690 for 4.007 miles south of Dupree to **Gross and Stevens**, Scottsbluff, Neb.

An oiled and concrete highway to replace the present 500-mile gravel surface across the state has been promised by Governor Berry in time for the Pageant of America in Rapid City which opens July 4, 1935 for two months.

Another Federal grant of **$3,000,000** for road construction has been received. Bids for additional work will be received late this fall.

Montana Notes

The construction of the new approach highway to Yellowstone National Park, which is scheduled to be completed in 1935, involves a great deal of heavy excavation. The highway connects Red Lodge, with Cooke,



Montana, a distance of 69.2 miles; a considerable portion of which lies in Wyoming. Cooke lies at the northeast corner of Yellowstone.

The road has been built in sections, starting in 1931. **Morrison-Knudsen Company** of Boise, Idaho, were awarded the grading contract on Section A involving 577,528 yards of excavation at altitudes from 7,733 to 10,707 feet. This section was 12.2 miles in length and followed the sidewalls of a canyon climbing up the Beartooth Mountain range by means of a series of switchbacks. The grading contract amounted to $494,386.

The nature of the work is seen in these two photographs, the upper view shows a Bucyrus-Erie Gas + Air 1-yard shovel at work in blasted granite near the summit of the range elevation 9,700 feet, the lower view shows the same machine side-casting on sloping work.

In addition to the Gas + Air shovel the contractor used a 1¼-yard Thew-Lorain and 1½-yard Link Belt shovel. Hauling was done with four 3½-ton Mack trucks, each hauling 3 yards.

Oregon Notes

The State Highway Commission has made the following awards: **Saxton & Looney** of Corvallis, 11.28 miles of grading and surfacing in Clatsop County for $63,285; **Fred H. Slate** of Multnomah, 2.53 miles of grading in Clatsop County for $94,181; **Wren & Greenough** of Portland, 17.78 miles of surfacing in Grant County for $97,790; **Dunn & Baker** of Klamath Falls, 2.84 miles of grading in Klamath County for $123,709; **Jacobsen-Jensen Company** of Portland, 3.3 miles of paving in Multnomah County for $145,725; **J. A. Terteling & Son** of Boise, Idaho, 1.28 miles of grading in Baker County for $46,473; also bridge over Burnt River for $13,764; **G. I. Stebbins Construction Company** of Klamath Falls, .71 mile of grading in Linn County for $44,445; **Parker Schramm Company** of Portland, 1.42 miles of grading in Multnomah County for $49,897; and **C. J. Montag** of Portland, bridge over Oregon Electric Railroad tracks for $26,932.

Grand Coulee Dam Notes

By GRACE KIRKPATRICK

J. A. Pomeroy, Inc., of San Francisco submitted low bid of $241,868 for the construction of a highway bridge over the Columbia River near the dam site.

Arizona Notes

By D. I. DAY

The New Mexico Construction Company has completed its 20-mile grading project on the Flagstaff-Fredonia Highway in Coconino County near the Grand Canyon Bridge.

The 3-mile grading job of **George K. Thompson** on U. S. 60 just north of Salt River will be completed by the middle of November.

G. W. Orr Contracting Company of El Paso is working on a new 4-mile grading contract on U. S. 60, some 40 miles northeast of the copper city of Globe.

Heafey, Moore and Casson have nearly completed an important piece of highway construction which begins at the line between Pinal and Maricopa Counties and extends eastward in Pinal County. The contract is for 26 miles of grading, draining, and placing of base course and oil surfacing on route U. S. 84, which leads to Casa Grande National Monument with its ruins of

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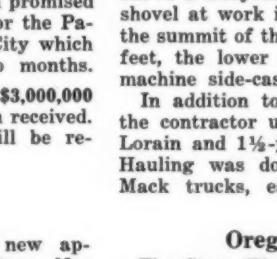

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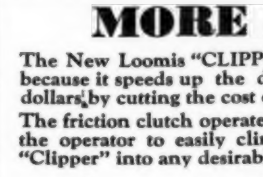

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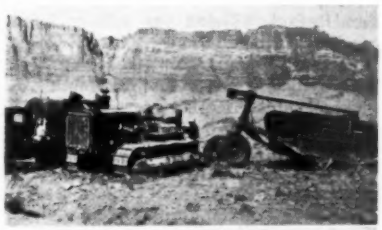
ancient buildings. This new road will be used not only to facilitate local traffic but will benefit the constantly increasing number of tourists who motor in southern Arizona.

Hodgman & MacVicar are at work in the National Forest country on an 8-mile project which starts at Clint's Well and runs north toward Flagstaff. The accompanying illustrations show their equipment in action.



In the famous Grand Canyon National Park, **G. R. Dailey and Vinson & Pringle** are well under way on grading and subgrade reinforcement on a road 9.1 miles in length. The project starts at the village of Grand Canyon and runs to a point known as Hermit's Rest. There is plenty of scenery surrounding this construction work as the road runs along the canyon rim.

M. J. Bevanda is making good progress on his 10.8-mile grading project between Kingman and Boulder Dam.

Skousen Brothers were low bidders at $44,577 on 3.2 miles of grading on the Cameron-Desert View approach to the Grand Canyon National Park.

Colorado River Aqueduct Notes

By K. CAMPBELL

George Fortier has been appointed general superintendent on the **Morrison-Knudsen** Mecca Pass job, succeeding Swan Dahlberg. Mr. Fortier will have complete charge of concreting operations. The first concrete lining work on the aqueduct was started there the first week in October.

The best progress for the month of September was made by the District's force account crew at Seven Palms tunnel, excavating 869 feet through rock heading. During one 24-hour period 54 feet were drilled in one heading.

Wenzel and Henock restarted mucking operations the middle of October at Potrero Shaft of the San Jacinto tunnel, as the water was down to the bottom of the shaft and under control.

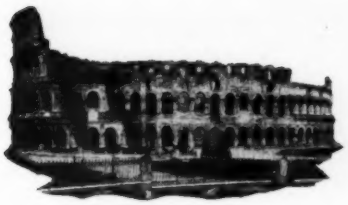
A road crew has completed cleaning up the gravel deposited in the highway dips west of Earp by the recent cloudburst. A considerable amount of rock loosened by the storm has been cleared away on the Intake road, recently built by **Clyde Woods**, road contractor. He used a patent oil spreader of his own make in building this road for the Metropolitan Water District and claims that it saved him 40 percent in labor costs, besides being a time saver.

West Construction Company drove through 533 feet of gravel at Whitewater tunnel No. 2 during the last month.

Hunkin and Conkey, drilling Hayfield No. 2, are now more than halfway through the 9677-foot tunnel.

J. F. Shea Company, drilling both East and West portals of Cottonwood tunnel have completed nearly 17,000 feet of their 20,105-foot tunnel job.

While **safety primers** have been used heretofore in mines it was not until recently that they were adopted for use in tunneling operations along the Colorado River Aqueduct. From now on they will be used in all blasting operations on the Coachella Division of the Aqueduct by the District forces. Several of the contractors are considering their use as well. This safety primer, described in the October issue of *Excavating Engineer*, consists of an electric blasting cap inserted and glued in a longitudinal hole bored through a wooden plug. Based on the experience of the Coachella Division for the past two and one-half months, during which time all headings have used safety primers, the definite statement has been made by those in charge that the primer will detonate successfully if the



12,000 Barbarians placed the Colosseum's stone

It took 12,000 slaves 10 years to build the greatest monument in Roman architecture. Begun by Emperor Vespasian in 72 A. D., the Colosseum accommodated 73,000 eager spectators for the barbarically splendid battles of the gladiators. Water piped beneath the large arena made it possible to form or drain an artificial lake at a moment's notice. The 80 ponderous arcades, the massive stone tiers, were built nearly 1900 years ago; but some of the same crude, rope-roller-lever methods which built them are still being used today.

IN HANDLING their quarry stone with slings the Roman engineers had no choice—but ancient methods are not necessary on today's job. There is a new and far better method utilizing the Bucyrus-Erie Rock Grab. Whenever large pieces of rock must be lifted, this unit will save time and expense. Easy, simple, safe in operation . . . it picks up, carries, and places rock weighing to 20 tons—and does it as easily and surely as you would pick up a match box between your fingers.

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Shots From the Firing Line—*Continued*

instructions for making and loading are followed. Missed holes have been experienced but to no greater degree than with dynamite primers. Investigations have determined that such misses have been due to placing the dynamite in contact with the wrong end of the safety primer, improper, faulty cap wire connections, or broken connections due to caving ground. The District believes there are numerous advantages obtained by the use of the safety primers, including an increased feeling of safety among the men. In general some saving in the amount of dynamite used has been found. The wooden primer plugs are very inexpensive and are easier to make than dynamite primers.

Soon after signing the contract for the Parker Dam construction, **Six Companies** awarded a contract to P. S. Webb of Boulder City for the construction of the permanent and principal camp buildings to be used by Six Companies at the new town of Whipple, California. These buildings include two dormitories for the housing of 258 men with provisions for extensions to accommodate 76 additional men; an office and dormitory which will house 15 men and provide office space for the contractor's staff; store room and mess hall to seat 232 men and provide clubroom facilities for the workmen and their families in camp. There will also be a hospital building, a four-room school building, and 20 two-family residences. The buildings are scheduled to be completed within 60 days. Construction forces for Six Companies are starting work on the street lighting and sewer facilities for their portion of the town of Whipple. The water supply will come from a well located at Gene Wash. J. P. Yates will be resident engineer on the job for Six Companies. A portion of the town will be occupied by the engineering forces of the government and it is understood that the government is to advertise soon for bids on its portion of the camp, including buildings and the installation of water, sewer, and power facilities. R. C. Link, of Los Angeles, was recently added to the Bureau of Reclamation staff as assistant engineer at Parker Dam.

Several **changes in personnel** have recently been announced in the District. J. B. Bond will be in direct charge of Divisions 4 and 5, while Division Engineer B. C. Leadbetter has been transferred to Division 4 succeeding R. B. Diemer. W. E. Whittier, formerly in the Distribution Department, has been made Division Engineer for Division 2. Assistant General Manager J. L. Burkholder has moved his office from Los Angeles to maintain closer contact with aqueduct operations in the field.

Work on the new five-mile highway section between the main Aqueduct road and the site of Division 2 is now under way, and preparations are being made for the launching of work on nine frame buildings at Division 2 headquarters, near Rice. The work comprises the erection of an office building, a mess hall, a 12-car garage, warehouse, three five-room cottages, a 20-man dormitory, sewage disposal plant, and water supply system.

Ancient deer tracks made in prehistoric days in soft clay and later turned to stone were found by workmen in the **Walsh Construction Company** crew at Colorado River tunnel about 2,000 feet from the Portal under two layers of volcanic rock. The tracks were perfectly preserved.

Utah Construction Company, drilling the west portal of Iron Mt. tunnel has completed 9,000 feet of the 16,172-foot tunnel.

California Notes

By H. L. LIVINGSTON

The following contracts have been awarded by the Bureau of Public Roads, San Francisco: **Frank C. Cuffe**, San Rafael, $85,481 for 4.25 miles of grading in the Plumas National Forest, Plumas County; **Hemstreet & Bell**, Marysville, $52,773 for .515 miles of grading and constructing a bridge in the Trinity National Forest, Humbolt County; **Tiffany Construction Company**, San Jose, $25,097 for 4.9 miles of graveling in the Lassen National Forest, Tehama County; and **Hein Bros.**, Petaluma, $66,968 for .962 miles of grading in the El Dorado National Forest, El Dorado County.

The following contracts have been awarded by the California Division of Highways: **Granfield, Farrar & Carlin**, San Francisco, $368,268 for 5.8 miles of grading and road mix in Santa Barbara County; **Clyde Wood**, Stockton, $42,579 for 9.3 miles of surfacing in Kern County; **Los Angeles Paving Company**, Los Angeles, $77,240 for .6 miles grading and asphalt concrete paving in Los Angeles County; and **Union Paving Company**, San Francisco, $29,750 for .3 mile of slide removal in Marin County.

The Mexican Government is planning to start work, January 1935, on an **irrigation project** on the Yaqui River in Sonora costing $3,500,000. This work involves a dam near Cananea, a diversion dam near Cuidad, Obregon and a dam on the Tamazula River.

The U. S. Engineers Office, Sacramento, has awarded a contract to **H. S. Palmer**, San Francisco, and **A. J. Grier**, Oakland, for $85,517 for constructing outfall gates on the Sacramento River near Colusa.

L. F. Moulton & Company, Orange County, are considering the construction of a dirt-fill dam in Aliso Canyon. The reservoir will have a capacity of 2500 acre feet of water. Estimated cost $100,000.

The County Board of Supervisors, Los Angeles, have placed a bond issue on the November ballot which, if passed, will create a fund of $26,332,-500 for financing **flood control projects** in Los Angeles County.

This interesting highway scene, loaned us by the Division of Highways of California, shows a portion of the road along the Trinity River between Oregon Gulch and Valdor. This unit is 8.96 miles long, involved the excavation of 293,361 yards of rock. The cost of grading and structures was $227,179.

By C. W. GEIGER

More than a million yards of rock and earth will be excavated in the construction of the new Broadway low-level tunnel project, new traffic link

between Alameda and Contra Costa Counties. Most interesting of the numerous engineering features of the project are the two one-way tunnels, each 3,168 feet long, 25 feet wide and 34 feet high. The bores are 15 feet apart at the portals and 100 feet apart in the center. The approaches are to have four traffic lanes. Ventilation will be handled by 16 large Sturtevant fans with a total capacity of 2,000,000 cubic feet of air per minute.

The cost of the Broadway low level tunnel project will be $3,683,931. Of this amount the PWA will put up 30 percent. The State contributed the sum of $300,000 and pledged $400,000 additional. The Highway District issued bonds for the balance of $2,378,000.

This new gateway to the East Bay Region, will replace the old Tunnel road, transforming Contra Costa County centers into suburbs of Oakland and bringing the slopes of Diable within easy commuting distance of the Ferry Building.

Southern California Notes

By K. CAMPBELL

Excavating for the $200,000 storm drain project in connection with the union passenger station in Los Angeles was started last month by the **United Concrete Pipe Company.**

After two months of preliminary excavation which included a 400-foot tunnel with a series of crosscuts, one million yards of rock was broken loose and set sliding to the water's edge in a fifty-ton powder blast set off by **Rohl Connolly Company,** contractors, in order to secure material for the 2-mile $7,000,000 Long Beach-San Pedro breakwater which they are building. Some of the rock will also go to the north and south jetties of the Newport harbor. The site of the blast was about two miles south of Avalon, on Catalina Island. The rock will be carried across the channel by barge.

Bids for dredging of Newport Bay as a part of the $1,835,000 Federal government program, were called the latter part of October. The dredging project will cost approximately $1,250,000, and 8,000,000 yards of material will be dredged from the bay and deposited along the six miles of ocean front. The channels will be dredged to fifteen and twenty feet and a yacht basin of thirty-five acres to a depth of fifteen feet will be made.

Mittray Brothers are using a new compressed air machine of their own make on the Jackrabbit Trail job. This machine runs 15-20 jackhammers at one time.

What may prove the outstanding petroleum development of the year has been started by the **Standard Oil Company** of California, which will spend $4,000,000 and keep 1,000 workmen employed during the next seven months, in building 108 miles of 12-inch welded pipe line from Rio Bravo to Estero Bay. This gigantic project will eliminate the uphill pumping from Bakersfield to Richmond. Estero Bay is about halfway between the refineries at El Segundo and Richmond and it was recently decided that tankers could pick up the oil at Estero Bay and deliver it to either refinery by boat cheaper than it could be pumped through a pipe line. Thus, the company is building a 12-inch line to take the place of the old line to Richmond, a distance of 281 miles. It has been estimated that perhaps 80 percent of the steel pipe needed for the new line will be salvaged from the old line. The line will be capable of transporting 50,000 barrels of heavy, or 70,000 barrels of light crude oil per day.

R. D. Walter, chief engineer for the Bureau of Reclamation recently appointed R. B. Williams as engineer in charge of **All American Canal construction.** The major excavation work will begin November 10.

Kelly and Cohen were having dinner together and Cohen helped himself to the larger fish.

"Fine manners ye have have, Cohen," said Kelly. "If I had reached out first, I'd have taken the smaller one."

"Vell," shrugged Cohen, "you got it, didn't you?"

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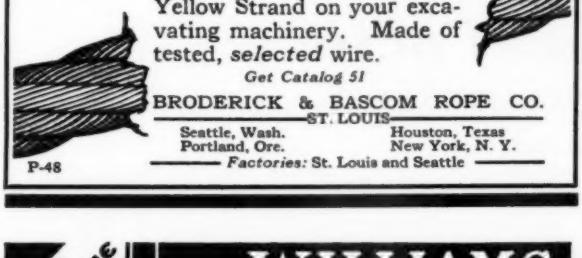

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Old Times & Old Timers

(Continued from Page 511)

"At the age of 12 I refused to go to school, thinking I knew enough, so Dad took me to Stewart Station, now called Trafford, Pennsylvania, about 28 miles east of Pittsburgh, to a big job by a big company, Booth and Flynn, Ltd. There were 7 shovels if I remember right. That was back in 1899 or 1900. Billy Floyd was Super, and a man named Kraig was another Super. I think you Old Timers remember this job. I was started driving a mule, spotting cars in a through cut. Model G Marion machines were the real thing then and they had steam on the boom, friction swing and hoist. I was promoted to pump runner, then to brakeman. Being so young, I was put back to switchman, then to firing for my father. My brother Harry, 2 years my senior, was Dad's craneman. So it turned out to be a family affair, and boy! did those Irish razz me. They would say, 'Hey, kid, go home and git your grandmither and have the whole family on the job.'

"Billy Floyd, the Super, was a hard guy to get along with. You had to take off your coat and offer him some fistic exercise before he would listen to you. Patty Doyle, a craneman, asked him for a job running a shovel. Billy told him to come out the next morning. Patty did and Billy Floyd handed him a hand shovel and said, 'Here's your shovel; that dago there with a pick will crane for you.' Pat didn't get sore, but Bill said, 'Come out tomorrow with a saw and hammer and tell me you're a carpenter; I'll give you a job.' Patty did just that, and old Billy put him to work. I have heard since that Pat Doyle was killed by a hog rod breaking and hitting him on the head. Other men on the job were Bosses Patty Joyce and Le Feaver; powder man, Jimmie Roberts (an Old Timer); shovel men, the Nichols' boys, Tom Quinlan, Pat Mooney, Jack Leahy, Tom McGovern, Billy McGovern, Lex McCabe, (killed there,) Harry McGlaughlin, his brother Frank, Jimmie Carvan, LaBelle, "Gold Tooth" Moore, Billy Leo, Ed Luther, Phil Ryan, Martin Cain; dinkey skinners "Fingerless" Burns, Dan Rooney, Rube Light, Johnnie Elders; George Kraig, (a dick for the Pennsylvania R. R. Co.); and Tommy Fay, who was the master mechanic.

"We left the job before it was finished and went into the coal business, but got hooked so badly we went back to the game when I was 15 years old for T. A. Gillespie at Holloway, Ohio on a Bucyrus 65. I was an extra craner, and dinkey skinner, and have kept at the game and watched the shovels develop into the modern types.

"I have seen the Bucyrus 'swing from the hoist' owned by the Pittsburgh Contracting Company, about the year of 1905 at Duquesne, Pa. Worked on a Vulcan shovel for Homestead Steel Mills. It had a friction crane, and the operator stood clear back beside the upright boiler. He couldn't see the pit at all. The craneman who stood on a platform with his head run up through the circle, had to signal the runner with his foot when it was O.K. I think it was a Vulcan shovel No. 1 and I never saw one like it before or after. If you fellows on the present-day rigs think you are badly abused sometimes, remember it's like taking candy away from a baby these days, compared to then."

Thank you, Old Timer Nichols. It is an interesting comparison you have made between the "old days" and the present time. We are sure your letter will interest the Old Timers and the "youngsters" too.

"Lips that touch wine shall never touch mine," declared the fair co-ed. And after she graduated she taught school for years and years and years.

The Vicious Cycle

By STANLEY DONALDSON

Red worked around some shovels
And he gossiped of things
To the runners; of liners
And of piston rings.

He oiled for Tim O'Leary
And he listened to him.
"If a man ever shovels,
He'll keep on," says Tim.

"A shovel's just as human
As the people you've met.
And a darned sight truer
Than a lot, you bet."

But the greasing got common
And the tally time slow,
And the pit mud bothered
'Till Red had to go.

Well, he got on a shovel
Through a lie and a card:
But the frictions turned tricky
And the ground was hard;

All the wagons were shaky
And the foreman stood near;
For the man that he followed
Was an engineer.

"If you ever quit shov'ling,
You'll be back," said Tim.
But that foreman said, "Never!"
And his mouth looked grim.

Next he hired on a skimmer
Down the line quite a way
Where people didn't know him
From a load of hay.

But he plugged a sticky friction
Ere the bucket points cleared
And the thing that happened
Is the thing you've feared.

Then the dragline he tackled
Was this cruel world's worst;
And the person who contrived it
Must have been accurst.

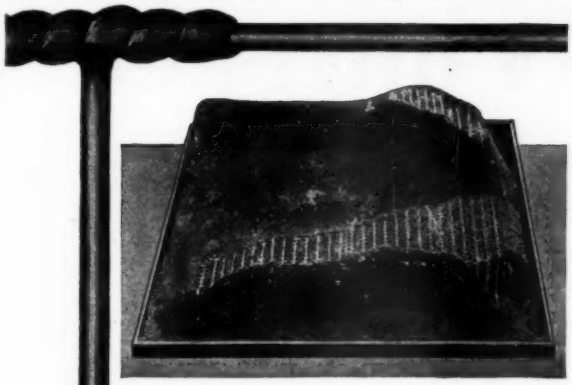
Its bucket didn't follow
And the ropes wouldn't track;
He always met the spreader
More than half-way back.

Before he got to craning
Someone put him in
At clamming out the bottom
Of a charging bin.

But a drifting boom took him
Or the tail got light
And he shoved two elevens
Down the hill that night.

Yet Tim O'Leary's proven
What he once stopped to say.
Red's back on the shovels
And he's there to stay.

True, the clutches are simple
And the bank is plowed,—
It's a RED EDGE shovel
With the half-sole crowd!



A Bird's-eye View . . . *close-up!*

Here is a model of a "giant blast," detonated and hooked up with Cordeau-Bickford Detonating Fuse. The Cordeau extends from the bottom to the top of each hole, thus detonating the explosive charge throughout its entire length. Since the explosive wave of Cordeau travels at a speed of approximately 3 miles per second, we have the practically instantaneous detonation of the entire charge.

The lines in the drill holes are connected to branch lines, which in turn are connected to the main line. This line has a detonating cap at one or both ends, depending on conditions.

While the detonation of Cordeau is practically instantaneous over the floor of the blast and throughout each charge, the hook-up can be so arranged as to permit relief of burden. In this model the separate charges in each branch line will "go" in succession, starting with those nearest the face of the shot. To the eye it will appear as though the entire blast discharged at once, yet the time interval, infinitesimal though it is, will result in successive relief of burden — more work from the explosives — better fragmentation.

The very features that have made the giant blast practicable and profitable, recommend the use of Cordeau in smaller hook-ups. It is an insensitive detonator — its use simplifies loading, promotes safety. It can be used with well drill, wagon drill or even jackhammer holes.

Consider Cordeau for your jobs. It is widely used in quarry work, and is growing in favor among contractors everywhere. The Ensign-Bickford Co., Simsbury, Conn.

CB-36

The Cordeau Book gives diagrams, photographs, and a factful story of this new technique in blasting. Free to executives.

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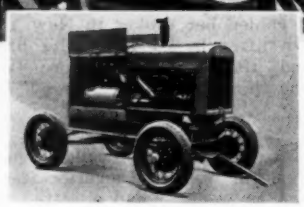

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Not in the Contract

A wealthy client insured her valuable wardrobe while traveling in Europe. Upon reaching London she found an article missing and immediately cabled her broker in New York: "Gown lifted in London." Her broker replied, after due deliberation: "What do you think our policy covers?"

"Was your father a college man?"
"Yes, but we never mention it. The college he went to had a rotten football team."

Contractor: "Have you a copy of 'Who's Who' and 'What's What,' by Jerome K. Jerome?"
Cohen: "No, but ve got 'Who's He and Vat's He Got,' by R. G. Dun."

"And did he have the dentist take an X-ray of his wife's jaw?"
"He tried to, but all he could get was a moving picture."

Voice over 'phone—Are you the blankety-blank-blank sales manager who sent that salesman to my office to sell me your blankety ——
Sales Manager—Yes, yes, but, my dear man, why — ?
Voice — Well, I gave orders to all of my staff to admit no one to my private office, and your man was so persistent that they were forced to get a gun —
Sales Manager — My goodness, man, they didn't shoot him, did they?
Voice — No, but my bookkeeper wants his gun back.

Indignant Contractor: "I'll bet this is the same steak I made you take back yesterday!"
Waitress: "Oh, no, sir—the man after you got that!"

"Henry," said his nagging wife as he prepared to retire, "is everything shut up for the night?"
"That depends on you," muttered Henry, "everything else is."

Co-ed (on a shopping tour): Where can I get some silk covering for my settee?
Floor Walker: Next aisle and to your left for lingerie.

Many a rural romance has started on a gallon of corn and ended with a full crib.

COURTESY COLLIER'S WEEKLY AND LAWRENCE REYNOLDS

I can't help it lady, if it was such a dull party you was at. I'm not supposed to let anyone fool with things."

"I hear you've been studying for months how to increase your salary. How did it turn out?"
"Poorly. The boss was studying at the same time how to cut down expenses."

"Beg your pardon, but what is your name, sir?" the hotel clerk asked.
"Name!" echoed the indignant guest who had just signed the register, "don't you see my signature there?"
"Of course," answered the clerk. "That's what aroused my curiosity."

"How old are you, Mary?"
"Fifteen."
"A girl of fifteen should tell her mother everything."
"I know it, but mother is so innocent, really I haven't the heart."

"Mary, were you entertaining a visitor in the kitchen last night?"
"That's fo him to say, mum, Ah was doin' the best I could."

Old Joe, a 'reet Lancashire lad,' had devoted all his leisure for many years to the game of bowls, a game that, whatever may be said against it, has the advantage of always having liquid refreshment close at hand. He once spent a few days with a friend in the south, and while there was prevailed upon to try his hand at golf.

"Well, Joe lad," said a crony on his return. "Did'st get any bowls down theer?"

"Nay," said Joe, "But they 'ad me trampin' round playin' a game called golf."

"Aye," said his friend. "I've heerd tell of it. What dos't think of it, Joe?"

"Dang me if I ever saw such a fool game," replied old Joe. "Tha'll never believe me lad; but one time we were a mile and a 'arf from't bar!"

Wife: "You're going to drive me out of my mind!"
Hubby: "That ain't no drive, my dear —that's a putt."

Boss: "There are two dollars missing from my desk and no one has a key except you and me."
Flapper Stenographer: "Well, let's each put in a dollar and forget it."

Book Reviews

Diesel Engineering — Diesel Engineering Handbook, Seventh Edition, 320 pages, 9 by 12 inches, attractively bound, published by Business Journals, Inc., 192 Lexington Ave., New York City, is seen as an important and helpful source of up-to-the-minute information on the operation, maintenance and care of equipment in Diesel plants.

This new edition is somewhat larger in size and broader in its editorial coverage of Diesel subjects than were previous editions. The editors have very effectively presented information required by the man who designs, builds or operates Diesel plants of all kinds. They have extended this treatment to cover the use of Diesels in the transportation field, particularly railway and automobile service.

Presented in this work are such subjects as an outline on the basic principle of the Diesel engine; Diesel economics; and development of new Diesel types. While the book is referred to as Diesel Engineering Handbook, it is really a combination of information on this subject and power plant engineering.

A chapter is devoted to planning and machinery installation. The electrical equipment in central power stations is given its due share of attention and another chapter is devoted to water-cooling and purifying systems. Part of the book is given over to lubricating oils and fuels. From the operators' viewpoint, perhaps the most useful chapter is the one devoted to operation, care and maintenance of the equipment in Diesel plants. Other important subjects are treated at considerable length. These include discussions of the various accessories employed in a plant such as pumps, filter systems and oil purification methods. The price is $5.00.

Ditch Blasting—Recently developed methods of ditch blasting, along with standard practices in effect for years, are clearly described in a 48-page book entitled "Blasting Ditches with Explosives," which has been published by the Agricultural Extension Section, **E. I. du Pont de Nemours & Company**, Wilmington, Delaware. It sets forth the methods of making ditches and their maintenance with explosives especially adapted to such requirements. The information applies to drainage as required for farm land, highway construction, and for other situations where drainage is necessary and can be accomplished in an efficient and economical manner by means of explosives. Copies of this book may be had by writing the manufacturer.

Monel Metal—A new booklet on the applications of monel metal, nickel, and nickel-clad steel has been issued by the Technical Service Department of the **International Nickel Company**. It has been prepared especially for users of industrial processing equipment. Besides giving data on the physical and mechanical properties of these materials, the booklet contains considerable miscellaneous information, including instructions on the selection of suitable welding rod and other details on fabrication. Copies will be supplied without charge on request to Editorial Department, The International Nickel Company, Inc., New York City.

Vibrated Concrete—A 32-page booklet published by the **Portland Cement Association** summarizes the most recent data on placing concrete by vibration. Vibration makes stiff mixtures workable and helps to produce a dense, watertight, durable concrete. Engineers now specify vibration for placing concrete in dams, bridges, roads, and structures. A copy of this booklet may be had by writing the Portland Cement Association, 33 W. Grand Avenue, Chicago.

Non-Clog Pumps—An 8-page bulletin, No. F434, illustrating and describing centrifugal pumps for handling of solids has recently been published by **Economy Pumping Machinery Co.**, 3431 West 48th Place, Chicago. These pumps have water ways sufficiently large to pass any solid which will go through the connecting pipes. Capacities range from 50 gallons per minute to 10,000 gallons per minute at heads up to 120 feet. The bulletin contains capacity tables, outline dimensions, and descriptive details. Copies may be had by writing the manufacturer.

Welding Applications — The Linde Air Products Company, 30 East 42nd Street, New York City, has published a new booklet, "The Maintenance of Reciprocating Parts," describing the application, by the oxy-acetylene process, of wear-resisting bronze to the wearing surfaces of sliding parts. The advantages of bronze-surfacing as an economical and efficient means of reclaiming pistons and similar wearing parts are fully set forth. Other sections of the booklet discuss frequency of application, characteristics of certain applications, and the importance of wear-resisting bronze welding rod, while the final section is devoted to a complete description of the correct procedure to be followed in the resurfacing operation. Copies will gladly be furnished on request.

Air Tools—"The World's Most Popular Pneumatic Tools" is the title of a new 8-page bulletin (2307-A) recently issued by **Ingersoll-Rand**, 11 Broadway, New York City. The bulletin lists for the first time the company's new sizes of Multi-Vane drills, push-throttle screw drivers and nut setters. It also illustrates and gives size-and-capacity tables of the I-R pneumatic drills, grinders, riveters, chippers, rammers, wrenches, hoists, etc. A copy of the new bulletin may be obtained by writing the above address or any branch office.

Bearings—Shafer Bearing Corp., 650 Grand Ave., Chicago, has recently published a new and very complete catalog, No. 12, covering Shafer roller bearings and self-aligning units. Copies may be had by writing the manufacturer.

Welders — Bulletin No. 30, recently issued by the **Lincoln Electric Company** of Cleveland describes in detail their SA-300, SA-400, and SA-600 Arc-welders. A copy may be had by writing the manufacturer.

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P&H MODEL 208—45' BOOM DRAGLINE—Cats—15½' long, 9' wide, 22" Treads. 100 HP. Waukesha High Alt. Engine. SCD-1.

P&H MODEL 208—45' BOOM DRAGLINE—4-cylinder 7¾"x9" Twin City gasoline engine and 1½ cu. yd. Omaha bucket. SCD-20.

BUCYRUS-ERIE 30-B DIESEL 40' BOOM DRAGLINE. SCD-21.

MONIGHAN MODEL 1-W WALKER — 60' Boom Dragline, 1¼ cu. yd. Page Bucket. Good condition. SCD-18.

MEAD-MORRISON GASOLINE COMBINATION SHOVEL-CLAMSHELL. ½ cu. yd. Dipper, 17' Dipper handle—18' Boom—32' Clamshell Boom and ½ yard Erie Clamshell Bucket. 5"x6" 4-cyl. Wisconsin Engine. Good mechanical condition. Bargain Price. SCD-28.

BAY CITY "PUP" GASOLINE CLAMSHELL. Good mechanical condition. SCD-24.

BYERS "BEARCAT" Gasoline ⅝-yard Shovel. Hercules engine. Overhauled. Good mechanical condition. SCD-25.

THEW-UNIVERSAL MODEL 35 — Gasoline — ½ cubic yard standard shovel equipment—25' lattice type crane boom and ½ yard Williams bucket with teeth—complete drag shovel attachment and skimmer scoop bucket, including home-made trailer. Excellent condition. SCD-26.

BUCYRUS-ERIE MODEL 30-B DIESEL SHOVEL—25'9" Boom, 14' Dipper Handle, 1 yd. Dipper. SCD-9.

KOEHRING MODEL 1—30' Boom Gasoline Crane. Cat Mounted—No Bucket—4½"x5" Wisconsin Engine. SCD-19.

GENERAL GASOLINE ½ CU. YD. SHOVEL—Buda 4-cyl. 4½"x6" Gasoline Engine. Only handled about 75,000 cu. yds. A-1 operating condition. SCD-27.

Shovel Equipment

¾ CU. YD. DIPPER—20' boom—13' Dipper Handle—rope crowd shovel equipment. Suitable for models 1030 or 1035—brand new. SE-1

¾ CU. YD. DIPPER—23' BOOM—15' DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Models 1030 or 1035. Brand New. SE-2

COMPLETE FRONT END EQUIPMENT

¾ YARD PLATE DIPPER, 19'9" BOOM, 18'4" DIPPER HANDLE—Shovel equipment suitable application Bucyrus-Erie B or B-2. Good condition. SE-29.

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¾ CU. YD. DIPPER—25'9" BOOM—14' DIPPER HANDLE—Shovel Equipment suitable for 30-B Diesel. Brand New. SE-17.

⅞ CU. YD. DIPPER—21'9" BOOM and ENGINE—15' DIPPER HANDLE — High Lift Shovel Equipment. Suitable for 31-B Steam. Brand New. SE-18.

1 CU. YD. DIPPER—20' BOOM—15' DIPPER HANDLE — Rope Crowd Shovel Equipment, suitable for Osgood "Conqueror." Good mechanical condition. Low Price. SE-24.

1 CU. YD. DIPPER—23' BOOM—12'6" Dipper Handle—Rope crowd shovel equipment. Suitable for D-2 machine. Brand new. SE-4

1 CU. YD. DIPPER—24' BOOM—18' DIPPER HANDLE—Slightly used but good conditioned. Suitable for any Bucyrus-Erie GA-2 or GA-3 Machine. SE-25.

1 CU. YD. DIPPER—24' BOOM—16' DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-26

1¼ CU. YD. DIPPER—22'6" BOOM—16' DIPPER HANDLE—Rebuilt and Guaranteed. Suitable for application Bucyrus-Erie GA2 or GA3 Machines. SE-27

1¼ CU. YD. DIPPER—25' BOOM—17' DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-5.

1½ CU. YD. DIPPER—23'6" BOOM—15' DIPPER HANDLE—Slightly Used Rope Crowd Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-6.

1½ CU. YD. DIPPER—27' BOOM—17' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable only for Bucyrus-Erie 43-B machines. Rebuilt—New Machine Guarantee. SE-23.

Dragline Equipment

35' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-2.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. Brand New. DL-6.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. Brand New. DL-7.

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on 30-B Diesel. Brand New. DL-8.

45' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. Brand New. DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Skimmer Scoop

⅝ CU. YD. DIPPER—20' Boom together with all necessary ropes and material to completely convert Bucyrus-Erie 1020 Shovel, Clamshell or Dragline to Skimmer Scoop Machine. Brand New. Shipment 2 to 3 weeks. SS-1.

Trench Digging Equipment

1 CU. YD. 42½" WIDE—Solid type Dipper—24' Boom and all auxiliary equipment. Will dig maximum depth 22'. For application to GA-2 or GA-3 Shovel. Rebuilt—New Machine Guarantee. DS-5.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38" wide over cutters, the other 49½" wide over cutters. 17'1½" Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

1-CU. YD. 42½" WIDE SOLID TYPE DIPPER—24' Boom and all auxiliary equipment—will dig maximum depth of 22'—For application to GA-2 or GA-3 Clam Shell or Drag Line. Rebuilt—New Machine Guarantee. DS-8.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

DIPPERS

Small Machines

2 ⅝ CU. YD.—Plate.—Will fit 20-B Steam or Gas. Brand New. D-12

1 2/3 CU. YD.—Plate front.—Will fit 14-B. Brand New. D-13

1 ¾ CU. YD.—Rock Type.—Will fit 20-B Steam or Gas. Brand New. D-15

3 ¾ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-16

2 ⅞ CU. YD. Plate front.—Will fit 1030 or 1035. Brand New. D-18

1 ⅞ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 1030 or 1035. Slightly used. D-36

1 ⅞ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 1030 or 1035. Brand New. D-37

1 ⅞ CU. YD.—Plate front.—Will fit 18-B. Brand New. D-20

1 ⅞ CU. YD.—Rock type. Will fit 31-B. Brand New. D-21

1 CUBIC YARD MANGANESE DIPPER. Will fit Bucyrus-Erie B-2 or GA-2. Good condition. D-40

2 1 CU. YD.—Cast Front Inserted Tooth Dippers. Rebuilt and Guaranteed. Suitable for application GA2 or GA3 Machines. D-34

1 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2, 41-B or 42-B. Slightly Used. D-26

2 1¼ CU. YD.—VAN PORT—ROCK TYPE. Will fit E-2. Brand New. D-27

1 1¼ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 37-B. Slightly used. D-38

1 1½ CU. YD.—PLATE. Will fit E-2. Brand New. D-28

1 1½ CU. YD. CAST FRONT INSERTED TOOTH DIPPER. Will fit 43-B. Slightly used. D-39

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly used. D-29

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30

Large Machines

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on 68-C and 70-C machines. Brand New. D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. Brand New. D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. Brand New. D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2¼" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. Brand New. D-5.

3 6 CU. YD. Molybdenum Steel Front. Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. Brand New. D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. Slightly Used but excellent condition. D-6.

DRAGLINE BUCKETS

BRAND NEW

1 ¾ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 890 lbs. DB-11

2 ¾ CU. YD. PAGE CLASS "C." Approximate weight each 2425 lbs. DB-1

1 1½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 2900 pounds. DB-15

3 2 CU. YD. PAGE CLASS "C." Approximate weight each 5630 lbs. DB-4.

1 2¼ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3850 lbs. DB-13.

1 2½ CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 4600 lbs. DB-14.

REBUILT

1 2 CU. YD. BUCYRUS-ERIE TYPE "U". Approximate weight 3200 lbs. DB-12.

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Approximate weight 6500 lbs. DB-9.

1 2½ CU. YD. OMAHA STANDARD. Approximate weight 5400 lbs. DB-10.

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.

Can also be used for Miscellaneous Service

Vertical Type

1 44½"x88½"—37 H.P.—145 lb. Working Pressure—Canadian Standard. Will fit B or B-2. B-4.

1 46½"x88½"—37 H.P. 150 lb. Working Pressure. Massachusetts Standard. Will fit any B-2 or B-3 Machine. B-7.

3 46½"x110"—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3. B-9.

1 54"x100"—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11

1 58"x7'9"—70 H.P.—150 lb. Working Pressure. Mass. Std. Will fit 42-B Machine. B-12.

Locomotive Type

3 44"x17'—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C. B-14.

2 54"x11'3"—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR — GENERAL ELECTRIC—75 HP., 2220 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC — 5-KVA. 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR — WESTINGHOUSE — 125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2) — GENERAL ELECTRIC — 21.5 H.P. 3 phase, 60 cycle, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

AIR COMPRESSORS

1 BRAND NEW WORTHINGTON——METAL-WELD—2-cylinder 7"x6" Vertical 162 cu. ft. piston displacement, Air Compressor. Fitted with Laidlaw feather valves—Lugs on side for mounting on skids or channels—Shaft extended and equipped with semi-flexible coupling to take 2⅝" drive shaft—Force feed lubrication. Automatic control. Includes 1" High capacity centrifugal circulating pump—"V" belt driven—18"x41" Air Receiver, 100 pounds working pressure. A.S.M.E. Standard. Electric or gasoline power required approximately 30 H.P., approximately 1000 R.P.M.—Compressor Speed approximately 550 R.P.M. — Overall dimensions: — Height 45"—Length 37½"—width 28". AC-3.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

1 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressor with fittings. Used. Make offer. AC-2.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—5-cylinder, 9" bore x 10½" stroke, 150 HP at 450 RPM, 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Also auxiliary air starting equipment. DE-2.

4 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—3-cylinder 6" bore x 8" stroke, 45 H.P. at 650 R.P.M., 4-cycle, Vertical—valve-in-head type. DE-5.

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 6" bore x 8" stroke, 60 H.P. at 650 RPM. DE-6.

Gasoline

1 MODEL HH-U NOVO—16 H.P. ENGINE—4-cylinder, 3⅜" x 4"—1200 R.P.M.—Radiator cooled—complete power plant—mounted on channels—sheet metal housing—extended crank shaft 1⅞" diameter, including outboard bearing with Fafner ball bearing. GE-1.

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½" x 5" reversible — —20.8 HP at 400 RPM. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 H.P. at 400 RPM. 100 lb. Pressure. ME-3.

2 5"x5" reversible—25.6 H.P. at 400 R.P.M. 100 lb. Pressure. ME-4.

TRAILERS

1-14 TON WILLIAMS "ECONOMY" TRAILER. Arch Girder Construction—Safety Chains—Rear Loading ramp. Solid Rubber tired wheels 28"x10" front 28"x16" rear. Deck dimensions 12'x7'9"x31½" high. Brand new. T-1.

PUMPS

1 NB — 3 STAGE CENTRIFUGAL PUMP — 2" suction and discharge — bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP Electric Motor. ME-5.

Trade Notes

The United States Rubber Company announces the appointment of Ralph C. Harden as manager of packing sales in the Mechanical Goods Division. He will be located at the company's main offices at 1790 Broadway, New York City. Mr. Harden brings to his new position a wealth of sales experience gained in the industrial field over a period of many years. During the last 15 years he held several important positions with the Johns-Manville Sales Corp., the latest of which was Western Regional Vice-President of Sales with headquarters in Chicago.

The annual meeting of the **International Acetylene Association** will be held at the William Penn Hotel in Pittsburgh on November 14th, 15th and 16th. The technical sessions of the convention will stress such important subjects as Oxy-Acetylene Cutting as Applied to Steel Mill Applications; the Metallurgical Aspects of the Oxy-Acetylene Welding Process; Pipe Welding and Testing; The Application of Welding to the Transportation Industries; and Education and Safety in Welding. The Association's Secretary is H. F. Reinhard, whose office is at 30 East 42nd Street, New York City.

Chain Belt Company announces the appointment of the **Liebel Supply Company**, 431 Main St., Lexington, Kentucky, as an exclusive distributor of Rex construction equipment in the Lexington territory. The Liebel Supply Company has been in the contractor's supplies and equipment business for a good many years. A stock of pumps and mixers is carried in their shop which enables them to make delivery to any point in the Eastern portion of the State of Kentucky within a few hours.

Effective September 17th, 1934, **The Baldwin Locomotive Works**, Philadelphia, Pa., assumed charge of all sales and engineering of the products of its subsidiary, **The Whitcomb Locomotive Company**, located at Rochelle, Illinois. A new department known as the Internal Combustion Locomotive Section of its Sales Department, under the supervision of H. H. Perry, Manager, assisted by H. V. Huleguard, located at Philadelphia, will handle all sales of Baldwin and Whitcomb internal combustion locomotives of all sizes, and sales of electric locomotives except to public service railroads. Whitcomb domestic sales agents will continue to sell in the name of Whitcomb. The Whitcomb plant will continue the manufacture of Whitcomb products at Rochelle, Illinois, in charge of Thomas H. Mars as Superintendent. Orders for repair parts, and the servicing of Whitcomb products in the field, together with attendant correspondence will be handled at Rochelle by L. W. Wrenn as Baldwin sales correspondent. Daniel B. Worth, Chief Engineer of The Whitcomb Locomotive Company, has joined the Engineering Department of The Baldwin Locomotive Works, Philadelphia, where he will be identified with the engineering of Baldwin and Whitcomb electric and internal combustion locomotives. Edward P. Hachtel, Whitcomb Production Engineer, remains at Rochelle where he will be in charge of inspection and will provide engineering contact with the Whitcomb shops.

Chicago Pneumatic Tool Company announces the change of address of its Birmingham, Ala. office from its former location, 1829-31 South Second Avenue to 211 South 20th Street. This change was effected August 31st and provides increased facilities for both sales and service activities. W. S. Lynch is Manager of the Birmingham District Office.

C. R. Jahn Company, distributors of LaCrosse heavy-duty trailers, announce the removal of their office to 760 Polk St., Chicago, Ill., Telephone Monroe 5144.

H. A. Everlien, Sales Manager, Mechanical Goods Division, **U. S. Rubber Products, Inc.**, recently announced the appointment of H. S. McPherson as Manager of Mechanical Sales in the St. Louis District. Mr. McPherson, who has been with the company for over 15 years, was formerly in charge of Mechanical Sales in the Boston District. Prior to that he held important posts in the Export Department in Australia, South America, and the Far East. W. G. Mueller, who has enjoyed for more than 25 years an interesting and successful record as a salesman with the company, largely in the Connecticut territory, has been promoted to be manager of Mechanical Sales, Boston Branch of U. S. Rubber Products, Inc.

The Fourteenth Annual Meeting of the Highway Research Board will be held in Washington, D. C., at the building of the National Academy of Sciences and National Research Council on Thursday and Friday, December 6 and 7, 1934.

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

OPERATOR

Thirty years experience on coal stripping, railroad and highway construction. Prefer coal stripping anywhere. Can do own repair work and furnish best of references. Married. Present location, Pennsylvania. Box 6501.

OPERATOR

23 years' experience on practically all makes of shovels, Draglines, Clamshell and Cranes, using steam, electric, gasoline or Diesel power. Single and willing to go anywhere in U. S. or foreign countries. Can do own repair work and furnish A-1 references. Present location, Wisconsin. Box 6900.

EXPERT DRAGLINE AND SHOVEL OPERATOR

16 years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie E-2, D-2, or 50-B or other Bucyrus-Erie machines. Have also operated Class 220 and 225 electric and Diesel electric machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California, but will go anywhere. Box 5507.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

SUPERINTENDENT

20 years operating and in charge of heavy strip mine and quarry equipment. 45 years of age. Can furnish references from any former employer and the largest manufacturer of excavating equipment in America. Can take full charge on reasonable notice. Box 5901.

OPERATOR-QUARRY FOREMAN

Have 25 years experience operating steam, electric and gasoline shovels and draglines on all classes of work. Can do own repair work. Also experienced quarry foreman with very best references. Married but willing to go anywhere. Present location Kentucky. Box 6200.

EXPERIENCED DRAGLINE OPERATOR

Fifteen years' experience on Bucyrus-Monighan, P&H, Northwest and other makes of Steam, Diesel, gas and electric draglines on levee work and phosphate mines. Hold three sets civil service papers with ratings of 70%, 85%, and 100%. Married but can go anywhere. Furnish excellent references. Present location, Louisiana. Box 5903.

ASSISTANT ENGINEMAN

Applications for the position of Assistant Engineman, Steam-Electric, Departmental Service, Washington, D. C., must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than November 26, 1934.

Certain specified experience, including experience with electrical machinery, is required.

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city which has a post office of the first or the second class, or from the United States Civil Service Commission, Washington, D. C.

GAS OR STEAM SHOVEL OPERATOR

7 years' experience on cutting slopes, gradings and highway construction, not afraid of work. Would like a position on any type of small machine anywhere in the U.S.A. Can do his own repair work and furnish good references. Box 6500.

STEAM SHOVEL OPERATOR

14 years experience with steam machines only on Railroad and Highway grading, coal stripping, Rock Quarry and Gravel Pits. Can do own repair work, furnish references and willing to go anywhere. Present location, Tennessee. Box 6700.